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REPORT

OF THE

Indian Tariff Board

REGARDING THE

GRANT OF PROTECTION

TO THE

STEEL INDUSTRY

00108620

CALCUTTA
SUPERINTENDENT GOVERNMENT PRINTING, INDIA
1924

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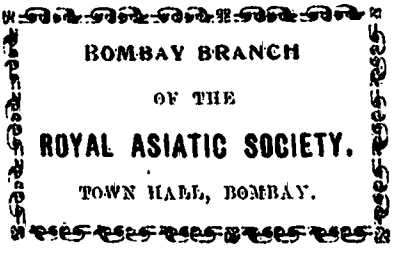

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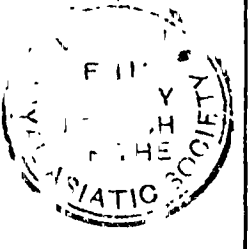

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First Report.

CHAPTER I.

Introductory.

Appointment of the Tariff Board.

The Tariff Board was appointed by the Resolution of the Government of India in the Department of Commerce No. 3478, dated the 10th July 1923, which reads as follows :—

" On February the 16th, 1923, the following resolution was adopted by the Legislative Assembly :—

" That this Assembly recommends to the Governor General in Council—

(*a*) that he accepts in principle the proposition that the fiscal policy of the Government of India may legitimately be directed towards fostering the development of industries in India;

(*b*) that in the application of the above principle of protection, regard must be had to the financial needs of the country and to the present dependence of the Government of India on import, export and excise duties for a large part of its revenue;

(*c*) that the principle should be applied with discrimination, with due regard to the well-being of the community and to the safeguards suggested in paragraph 97 of the Report of the Indian Fiscal Commission;

(*d*) that in order that effect may be given to these recommendations, a Tariff Board should be constituted for a period not exceeding one year in the first instance, that such Tariff Board should be purely an investigating and advisory body and should consist of not more than three members, one of whom should be a Government official, but with power, subject to the approval of the Government of India, to co-opt other members for particular inquiries."

2. The Government of India have decided to appoint a Tariff Board, for a period not exceeding one year in the first instance, to carry out the investigations resulting from the acceptance of

that resolution and to make recommendations thereon. The following gentlemen have agreed to serve on the Board :—

President.

G. RAINY, Esquire, C.S.I., C.I.E., I.C.S.

Members.

The Hon'ble Mr. V. G. KALE, Professor of Economics, Fergusson College, Poona.

P. P. GINWALA, Esquire, M.L.A., Bar.-at-Law.

Rai Bahadur S. N. Banerji, Assistant Secretary, Commerce Department, has been appointed Secretary to the Board.

3. The Government of India will select the industries to be taken up for investigation and determine the order of the inquiry and it will be the duty of the Tariff Board, after such examination as it thinks necessary, to make recommendations regarding the protection (if any) to be extended to those industries and the nature and extent of the protection. Firms or persons (other than those referred to in the next paragraph) desiring that the industries in which they are interested should be investigated by the Tariff Board should apply to the Secretary to the Government of India in the Commerce Department. With their applications they should send up a full statement of the reasons why they consider that protection should be extended to the industry.

4. The Board will assemble immediately at Simla. As recommended by the Fiscal Commission in paragraph 107 of its Report, the Board will examine first the question of extending protection to the manufacture of steel in India. In considering this question, the Board will take into account the effect of any recommendations it may make on industries dependent on the use of steel, and in particular, it will consider how its recommendations will affect the industries* referred to in paragraph 9 of the Report of the Railway Industries Committee, and whether those industries should be accorded protection. Firms or persons interested in the steel industry or the industries dependent on the use of steel, who desire that their views should be considered by the Tariff Board, should address their representations to the Secretary to the Board.

The headquarters of the Board will be with the Government of India, but it will visit from time to time commercial and industrial centres in India for the purpose of the investigations which it may be required to undertake. While the steel industry is under

* These industries are the locomotive and wagon building industries.

examination, the office of the Board will be located temporarily at Calcutta. For the investigation of other industries, it may be necessary to transfer the office from time to time to other convenient centres.

5. The Government of India trust that Local Governments and Administrations will afford the Board all the assistance which it may require and will comply with any request for information which may be addressed to them by it."

It will be seen that the Board was directed to examine first the question of extending protection to the manufacture of steel in India : at the same time it was instructed to take into account the effect of any recommendations it might make on the industries dependent on the use of steel, and in particular to consider how its recommendations would affect the railway wagon and locomotive building industries.

Proceedings of the Board.

2. The Board assembled at Simla at the beginning of July and after preliminary work proceeded to Jamshedpur early in August where evidence was taken on behalf of the Tata Iron and Steel Company. Mr. R. Mather, Metallurgical Inspector to the Government of India, who had been deputed to assist the Board as technical adviser, joined his duties at Jamshedpur on return from leave. At the beginning of September, the Board proceeded to Calcutta where its office was located during the greater part of the enquiry. The works of a number of engineering firms both at Jamshedpur and in the vicinity of Calcutta were inspected by the members of the Board, and two visits were paid to Asansol in order to see the wagon building and other engineering works in that neighbourhood. A large number of representations were received from firms and persons interested in the steel industry and oral evidence was also taken from numerous witnesses both official and non-official. The oral evidence was taken both at Calcutta and at Bombay where the Board spent two or three weeks in the latter part of November. A fuller account of our proceedings will be submitted later, but as we are anxious to lay before the Government at the earliest possible date an expression of our views on the main question referred to us, we shall not at this stage enter into further detail.

Scope of the First Report on the steel industry.

3. The primary question with which we have to deal is whether protection should be accorded to the manufacture of what may be called rolled steel. At present there is only one firm in India which manufactures steel on a large scale, namely, the Tata Iron and Steel Company whose works are at Jamshedpur. Steel castings, however, are produced by three firms, but none of them

has as yet gone beyond the initial stages of manufacture. The industries directly dependent on the use of steel fall naturally into three groups :—

(*a*) The engineering industry which includes a number of firms which manufacture a large variety of articles of iron and steel;

(*b*) The subsidiary industries comprising firms which have devoted themselves to the manufacture out of raw steel of some particular class of goods.

(*c*) The railway wagon and locomotive building industry.

We propose in this Report to concentrate our attention on the main question, which is the manufacture of rolled steel. Our detailed recommendations regarding the other industries we shall postpone to a subsequent Report which we hope to submit at a very early date.

Kinds of steel manufactured in India.

4. Of the important kinds of steel in use only one, namely "basic open hearth" steel, can be made in India from Indian materials. Indian pig iron contains a comparatively high percentage of phosphorus derived rather from the coal than from the iron ore, and this phosphorus has to be removed by the use of lime in the steel furnaces. The so-called "acid" steel is made from pig iron containing only a small percentage of phosphorus which requires no special measures for its removal.* In the 'basic' process the furnace is lined with burnt dolomite which is chemically a base, while in the acid process the lining is pure sand which acts chemically like an acid. Acid steel can be used for practically every purpose for which basic steel is used, and also for purposes for which under existing regulations basic steel is inadmissible, *e.g.*, the boilers, axles and tires of locomotives. The use of acid steel is still compulsory for the axles and tires of railway wagons in India, but there is an alternative British Standard specification which permits the use of basic steel. The basic process is not used for the production of the high grade and special steels (sometimes alloyed with other metals) required for cutting tools and all articles in which great hardness or toughness is required, but the manufacture of these steels is not likely to be attempted in India for many years to come. Our enquiry therefore is confined to basic open hearth steel and such steels as compete with it for ordinary purposes.

Description of processes of iron and steel manufacture.

5. The processes of iron and steel manufacture are somewhat technical, and it may be useful if at the outset some general description of those employed in India is given. The important

* The "basic" Bessemer process cannot be used in India for the converse reason that Indian pig iron does not contain enough phosphorus.

raw materials required for the making of steel are iron ore, a mineral which contains iron; coal, which is used as a fuel for producing high temperatures and as an agent for separating the iron from the oxygen with which it is combined in the ore; and limestone or dolomite, which are used as fluxes for carrying away in the form of a fusible slag the impurities which occur in the ore and in the coal.

Two main stages of manufacture—(1) pig iron and (2) steel.

6. There are two main stages in the production of steel from iron ore. In the first, the ore is converted into pig iron, a crude form of iron which contains impurities to the extent of about 6 or 7 per cent. This operation is performed in ' blast furnaces '. In the second stage the impurities of the pig iron are removed to the necessary extent in ' open hearth furnaces '. The product is then steel. Both these operations require very high temperatures—about 1600° C.—in the furnaces and both yield molten products.

Manufacture of coke and its bye-products.

7. Very few kinds of coal are suitable for use in the blast furnace direct, and the first step in the manufacture of pig iron is therefore the conversion of coal into coke. The coke is made by heating crushed coal of a suitable quality in " coke ovens ", which are built mainly of silica bricks and fire bricks. The ovens are heated to a high temperature by burning (in flues round the ovens) part of the gas which is given off from the coal. The direct products of the operation are coke and a fuel gas which is similar to ordinary town gas. The gas contains tar, which is separated for use elsewhere in the works or for sale, and also ammonia which is separated by means of sulphuric acid, forming sulphate of ammonia which is a useful fertilizer. Since only a part of the gas which comes from coal is needed for heating the ovens, the remainder is " surplus " gas which can be used in heating furnaces in other parts of the works. The tar and the sulphate of ammonia are " bye-products ", the value of which reduces the net cost of the coke. Most of the sulphate of ammonia produced in India is exported to Java and Mauritius for use as a fertilizer in the sugar plantations in those islands, and it is regrettable that more use is not made in India itself of a very important aid to agriculture.

The blast furnaces.

8. The coke thus produced is charged, together with iron ore and flux (at Jamshedpur, dolomite), into the blast furnace which is essentially a high shaft built of special bricks and of different internal diameters at different heights. A blast of hot air is blown into the furnace to burn the coke. This produces the necessary temperature in the furnace and provides the conditions in which the iron is

separated from the ore and in which the impurities in the ore and the coke join with the flux to form a slag. This slag is lighter than the molten iron and separates itself by floating on the top of the iron. The products are molten pig iron, molten slag (at Jamshedpur about half a ton of slag for each ton of pig iron) and " blast furnace gas " which is combustible. The gas can be used for heating the blast of air, for heating certain furnaces and (by burning under boilers or in gas engines) for the production of power. Between one-third and one-half of the gas is required for heating the blast and for the engines producing the blast. The remainder is surplus and can be used for other furnaces and for power. The slag is of little value.

The open hearth steel furnaces.

9. The open hearth furnace is built of fire-brick, silica-brick and magnesite brick and has a concave oval hearth of burnt dolomite or magnesite. The furnace is heated by burning gas (usually generated from coal in a special apparatus called a gas producer). The pig iron and such steel scrap as is available are put in the furnace and the molten mixture is treated with a small proportion of iron ore and with lime. The ore and lime remove almost the whole of the impurities from the pig iron (forming a slag which is practically valueless) and the process is adjusted to yield steel having a composition which will produce the necessary mechanical properties in the finished article. The steel leaves the furnace in a molten condition.

The rolling mills.

10. The steel having thus been made, it only remains to give it the final form required by the user. For this purpose it is cast into " ingots " which are blocks of (at Jamshedpur) about 5 feet high and 20 to 22 inches square, weighing about 3 tons each. The ingots are then brought to the necessary shape by rolling in " rolling mills ", in which the hot steel is passed between suitably grooved rolls rotated by sufficiently powerful engines or motors to squeeze the steel to the desired shape of cross-section. The ingot passes first through the " blooming mill ", which reduces it to a " bloom " having a section of 6 to 9 inches square or to a " billet " usually about 4 inches square, the length being in each case proportionately increased. The bloom then passes to the " rail and structural mill " where it is given the final shape of a rail or of a structural section such as a beam. The billet, which is intended for smaller sections, is transferred to a " bar mill " where it is given the final shape of the bar required.

Quantities of materials used.

11. In the process of converting pig iron into finished steel there is a certain wastage of the raw material. About five per cent. is lost in the steel furnaces, and in the rolling mills another five per cent. disappears

owing to the formation of scale on the surface of the hot metal. But in addition the rolling process necessarily involves the creation of a considerable amount of scrap, *i.e.*, portions of the ingots, blooms, billets, etc., removed in the process of rolling. Of each ton of steel ingots only about 15 cwts. appear as finished steel. Out of the balance of 5 cwts. nearly 1 cwt. is finally lost or can be used only as material for the blast furnaces. The remainder* (more than 4 cwts.) is scrap which is unusable as steel; but it can still be used as the raw material for steel, and it goes back into the steel furnace along with the pig iron as part of the metallic charge. It is, in fact, pig iron from which the impurities have been removed and it only requires to be remelted in order to become available. The net consumption of pig iron is therefore about 11 tons for every 10 tons of finished steel.† For each ton of pig iron produced, the approximate consumption of iron ore is $1\frac{3}{4}$ tons and of coking coal $1\frac{2}{3}$ tons. Similarly for each ton of finished steel, nearly two tons of iron ore and about $1\frac{5}{6}$ tons of coking coal are used.

The Duplex process.

12. The above description applies to the older and simpler portion (West plant) of the Jamshedpur works. In the newer portion (Greater Extensions or East plant) there are certain differences in the steel making and rolling. The pig iron is converted into steel by a "Duplex" process, in which the molten iron is first poured into a "Bessemer converter"—a large vessel lined with refractory material—in which air under pressure is blown through the metal. When part of the impurities of the pig iron have been removed by the air, the still molten metal is transferred to a large tilting open hearth furnace in which the remainder of the impurities are removed and the quality of the steel is finally adjusted. This furnace works on the same principles as the open hearth furnace already described, but the size and mechanical arrangements are different.

The new mills.

13. The steel ingots from the new plant are rolled in a new blooming mill. Nearly all of them become blooms, but some are rolled (in this mill) into 'slabs' which are thick flat pieces (generally about half as wide as they are long) which are suitable for rolling into plates in a special plate mill. Some ingots will be specially cast into a form resembling a large slab for direct rolling in the plate mill. Some

* In the cost accounts the scrap recovered is valued at a uniform rate per ton. The department in which it is produced is credited with the value at this rate, and a corresponding debit is made for scrap used in the Open Hearth Department.

† This ratio holds good only if two conditions are fulfilled—

(1) That all the scrap produced in the works goes back into the steel furnaces;

(2) That no scrap is used which is brought in from outside the works.

of the blooms from the new blooming mill will be transferred to a new rail mill to be rolled into rails and structural sections. The remainder of the blooms will go to a " sheet-bar and billet mill " which consists of several sets of rolls placed one immediately behind another so that the bloom passes through them successively, travelling always in one direction. Such mills are " continuous ". In this mill the bloom is rolled either into small billets or into " sheet-bars ", which are long, thin, flat bars (for example, 20 ft. long, 8 inches wide and $\frac{1}{2}$ inch thick) which are cut into short lengths for rolling in a " sheet mill " into thin sheets such as are used for galvanised sheets and tin plate. The small billets from the sheet-bar and billet mill go to a continuous ' merchant mill ', or bar mill, which will roll them into bars of the ordinary small sections suitable for the merchant trade. This will also produce ' wire rods', *i.e.*, round rods less than $\frac{1}{4}$ inch diameter suitable for being drawn into steel wire.

The Tata Iron and Steel Company.

14. The works of the Tata Iron and Steel Company are situated at Jamshedpur in the Singhbhum district about 150 miles to the west of Calcutta. The Company was formed in 1907 and the construction of the works began in 1908. Pig iron was first produced in December 1911 and steel in 1913, and by 1916-17 the old plant, under the stimulus of the war demand, was in full production. In that year a very large scheme of extensions (known as the Greater Extensions) was mooted and is now (February 1924) on the eve of completion. It was originally hoped to complete the extension scheme in 1920 or 1921, but construction was very greatly delayed, first because, during the period of hostilities, priority certificates had to be obtained from Government before the manufacture of the new plant could begin, and secondly because, when the war was over and the post-war boom in iron and steel began, there were inordinate delays in the delivery of the machinery already ordered. By 1921-22, the only part of the new plant directly contributing to production was the third blast furnace. During 1922-23 and 1923-24 other parts of the plant have begun to operate, and the remainder will do so in 1924-25.

Actual and future production of the Tata Iron and Steel Company.

15. The finished steel products manufactured by the Company in the old plant comprise rails and heavy structurals (beams, angles, channels, etc.) in the rail mill, and bars, light structurals, light rails and fish plates in the bar mill. The additional products which the Company will be equipped to manufacture in the new plant are plates, sheets—black and galvanised—sheet-bars and steel sleepers. The following table compares the production of

the years 1916-17 and 1921-22 with the production expected when the new plant is in full operation :—

	Production in 1916-17.	Production in 1921-22.	Production expected when new plant is in full operation.
	Tons.	Tons.	Tons.
Coke	230,532	359,923	850,000
Pig iron produced	147,497	270,270	610,000
Pig iron sold	39,541	104,402	40,000
Steel ingots	139,433	182,107	570,000
Finished steel—			
Heavy rails	54,021	77,880	235,000
Heavy structurals	14,888	18,393	
Light rails and fishplates	5,379	6,580	62,000
Bars and light structurals	24,489	23,018	
Plates	...	...	48,000
Sheets	...	...	36,000
Sheet-bars	...	...	35,000
Sleepers	...	..	3,000
Blooms and billets for sale	...	...	3,000
Total finished steel	93,726	125,871	422,000

The production of pig iron increased by more than 80 per cent. between 1916-17 and 1921-22, mainly owing to the construction of the third blast furnace. Steel production increased, but only by about 27 per cent., owing to the erection between 1916-17 and 1921-22 of three new open hearth steel* furnaces. The output expected when the new plant is in full operation is more than twice the 1921-22 output of pig iron and more than three times the output of finished steel.

* These are additions to the old plant and not part of the extension scheme.

CHAPTER II.

The Steel Industry and the conditions laid down by the Fiscal Commission.

The claim of the Tata Iron and Steel Company on behalf of the Steel industry.

16. The claim of the Tata Iron and Steel Company for protection to the steel industry is embodied in their original representation dated the 27th/28th July 1923. Briefly the proposal made was that an all-round duty of 33⅓ per cent. *ad valorem* should be imposed on all kinds of steel manufactured by the Company at Jamshedpur. When we endeavoured to ascertain on what basis this figure had been arrived at, no very lucid explanation was forthcoming. Mr. Peterson, giving oral evidence on behalf of the Company, stated that generally the Company were of opinion that rolled steel was likely to enter India at a price, without duty, of about Rs. 150 per ton, and that the Company could sell steel at a reasonable profit " at or under Rs. 200 a ton." A claim so vaguely conceived clearly required the closest scrutiny before any conclusion could be formed as to its merits. This involved a minute examination of the cost of production of rolled steel at Jamshedpur and a review of the fluctuations in the price of imported steel. The results of our investigations will be set forth at length, but in the first instance it is necessary to consider the claim of the steel industry to protection from a more general point of view.

The conditions laid down by the Fiscal Commission.

17. In paragraph 97 of their report, the Fiscal Commission laid down three conditions which in their opinion should be satisfied in ordinary cases before a claim to protection is entertained. These conditions have been approved by the Government of India and the Legislative Assembly. They are as follows :—

" (1) The industry must be one possessing natural advantages, such as an abundant supply of raw material, cheap power, a sufficient supply of labour, or a large home market. Such advantages will be of different relative importance in different industries, but they should all be weighed and their relative importance assessed. The successful industries of the world possess certain comparative advantages to which they owe their success. No industry which does not possess some comparative advantages will be able to

compete with them on equal terms, and therefore the natural advantages possessed by an Indian industry should be analysed carefully, in order to ensure as far as possible that no industry is protected which will become a permanent burden on the community.

(2) The industry must be one which without the help of protection either is not likely to develop at all or is not likely to develop so rapidly as is desirable in the interests of the country. This is an obvious corollary from the principles which have led us to recommend protection. The main object of protection is either to develop industries which otherwise would not be developed or to develop them with greater rapidity.

(3) The industry must be one which will eventually be able to face world competition without protection. In forming an estimate of the probabilities of this condition being fulfilled the natural advantages referred to in condition (1) will of course be considered carefully. The importance of this condition is obvious. The protection we contemplate is a temporary protection to be given to industries which will eventually be able to stand alone."

India's resources in iron ore.

18. Our enquiries have satisfied us that India possesses great natural advantages for the production of steel and iron and that the first condition laid down by the Fiscal Commission is therefore fulfilled. Of the raw materials required the three most important are iron ore, coking coal and limestone (or dolomite) for fluxing purposes. Large deposits of iron ore exist in many parts of India, particularly in the Central Provinces, but at present by far the most important are those which lie in the so-called ' iron belt ' extending over the district of Singbhum and the adjoining Feudatory States of Orissa. The belt contains enormous quantities of extremely rich iron ore in which the proportion of metallic iron frequently rises above 60 per cent. This ore can be mined cheaply and landed at the Iron and Steel works at a cost of between Rs. 3 and Rs. 4 per ton. The Director of Geological Survey has supplied us with extracts from a report* by Dr. Fox, an officer of the Department, on the mineral resources of India for a domestic steel industry, in which the iron ore deposits of the country are described. Dr. Fox mentions two estimates of the quantity of high quality iron ore available in the so-called ' iron belt ', both of them in the neighbourhood of 3,000 million tons. Other authorities have taken

* See Annexure.

lower figures and, until further exploration has been made, no exact estimate is possible, but there is general agreement that the quantity is very large. In other parts of the world equally rich ore is to be found, but it cannot be landed at the iron works at anything like the same price. Conversely, equally cheap ore exists in some countries but of nothing like the same quality. The advantage India possesses in the shape of iron ore is therefore very great.

Coking coal.

19. India's resources in coking coal, so far as they have been ascertained, are not on the same scale as her supplies of iron ore. In quality Indian coal is inferior to the coal available in the great steel making countries of the West, and the high percentage of ash content renders it necessary to use more coke in the blast furnace. Nevertheless, since even now Indian coal is relatively cheap, the total cost of coke per ton of pig iron is not excessive. The question of quantity is more serious. It has been discussed both by Dr. Fox in the report already referred to, and by Dr. Pascoe, the Director of the Geological Survey, in his forwarding letter. Both officers explain the great difficulty there is at present in forming any definite estimate of the total quantities of coking coal suitable for metallurgical purposes which are available in India, and until the experts have investigated the matter further, it would be useless for us to enter on any detailed discussion. The last sentence of Dr. Pascoe's letter, however, is important. "I think it is safe", he writes, "to conclude that, assuming 3 tons of coking coal to be necessary to produce 2¼ tons of coke, there is enough coking coal in India to supply the iron and steel industry with 4 million tons of metallurgical coke per annum for the next 150 years at least".

Conclusions regarding the supply of coking coal.

20. The general conclusions which the evidence suggests might perhaps be stated as follows:—

(1) There are sufficient supplies of coking coal available to meet the needs of a steel industry capable of providing for India's own requirements and a certain surplus for export for over a century.

(2) The question whether coking coal exists in sufficient quantities to justify the establishment of a large export trade in steel cannot be settled until further surveys and explorations have been made.

(3) The information at present available suggests the desirability of conserving India's resources of metallurgical coking coal. It would clearly be unfortunate if large quantities of very rich ore could not be utilized in the country for want of a suitable fuel.

The last point is clearly important. It is conceivable that new discoveries may render it possible to utilize in the manufacture of iron coal which is at present classed as non-coking. It is possible also that fresh discoveries of coal may be made in regions where iron ore is also present. Thus, for example, in the course of the surveys for new railway lines crossing the belt of feudatory states which lie between Chota Nagpur and the Central Provinces, the existence of coking coal has been proved in at least two coalfields (Jaghakhand and Jhilmili). It is unsafe of course to place much reliance upon mere possibilities, and the need for a thorough investigation of the question by the Geological Survey is obvious in order to remove the uncertainty which exists. But the doubt relates only to the comparatively distant future, unless the growth of the iron and steel industry in India exceeds all expectations. The Tata Iron and Steel Company informed us that they believed they had 400 million tons of coking coal in their mines in the Jharia and Raniganj fields, and the United Steel Corporation of Asia have also secured ample supplies of coking coal.

Vicinity of the coalfields and the iron ore deposits.

21. The present pre-eminence of the Singhbhum and Orissa iron belt is due not only to the richness and abundance of the ore deposits but also to the fact that they are situated at a distance of about 200 miles more or less from the coalfields. This is important because the freight on raw materials is a heavy item in the cost of production. The Tata Iron and Steel Company at present brings its iron ore from a distance of about 50 miles and its coal from an average distance of a little over 100 miles, the freights paid being about 7½ annas and Rs. 1-5-6 per ton respectively. It would be easy to quote instances, both from Europe and America, where the manufacturer obtains his supplies of raw materials from a much shorter distance, but on the continent of Europe either the coal or the ore has often to be brought from a distance of 200 miles or more, and in America the distances are much longer. The greatest centre of steel manufacture in the world is the western district of Pennsylvannia, which brings its iron ore from the western shores of Lake Superior, more than a thousand miles distant, the journey involving a double transference from rail to water carriage and *vice versa*, and its coal by rail from a distance of about 60 miles. It will be seen, therefore, that in this respect India possesses a natural advantage over many countries.

Limestone.

22. In respect of fluxing materials India does not possess the same superiority as in ore, but economically is at no disadvantage. Limestone of the best quality is to be found in India, but at such distances from the

iron ore and coal as to preclude its use for metallurgical purposes. There are, however, ample supplies of limestone and dolomite within a reasonable distance of the other raw materials. These supplies though not equal in quality to those available in other countries are nevertheless sufficient for the purpose. Larger quantities have to be used but, as the materials are cheaper, the cost of flux is not on the whole higher than it is elsewhere.

Other raw materials.

23. Most of the other materials required by the industry exist in India, and the few exceptions are only required in small quantities. We need only mention :—

(*a*) manganese, of which ample supplies exist in the Central Provinces, and

(*b*) refractory materials.

Amongst the latter fireclay exists in many parts of India and the manufacture of fire-bricks is carried on extensively. The manufacture of silica bricks was also established during the war at Kumardhubi, raw materials of excellent quality being obtained from the south of the Monghyr district. The silica bricks produced in India are probably not yet equal in quality to those produced in Europe and America, but the quality is improving and we see no reason why eventually full success should not be attained.

Low cost of manufacturing pig iron in India.

24. Of the natural advantages which India possesses for the manufacture of iron and steel, no better proof can perhaps be given than the fact that she already produces pig iron more cheaply than any other country in the world and a considerable export trade with Japan and the West coast of America has come into existence. The low cost of pig iron means that the Indian steel manufacturer starts with a distinct advantage over manufacturers elsewhere, but at present this advantage is lost owing to the higher cost of the subsequent processes. It has already been proved by the Tata Iron and Steel Company that steel of a thoroughly sound quality can be manufactured in India, and the steel furnaces during the war attained a rate of output not inferior to that of western countries. It has not hitherto been found possible, however, in India to combine high output with satisfactory quality. During the war quality had to be sacrificed to quantity and since the war quantity to quality. The problem remaining to be solved is how to increase the rate of production without sacrifice of quality, and as soon as that has been done, India's natural advantages will have full play.

Indian labour in the steel industry.

25. The question of the natural advantages and disadvantages of an industry has other aspects besides that of the raw materials, and the Fiscal Commission referred specially to labour and the market for the goods produced. In respect of labour India suffers under a disadvantage inevitable in any country which is mainly agricultural, and where industrial experience and training has still to be acquired. This renders it necessary at present to import skilled supervision from Europe or America for the more difficult processes involved in the manufacture of iron and steel. This is a temporary difficulty which will eventually disappear. As regards unskilled and semi-skilled labour wages in India are relatively low, but it is doubtful whether in this matter India has any advantage. Low-paid labour is not necessarily cheap, and far more men are employed in iron and steel works in India than would be considered necessary in western countries. In this matter also time should work an improvement.

The Indian market for steel.

26. The market for steel in India is of course not comparable to that which exists in European countries or in America, but large quantities of steel are imported annually. Up to the outbreak of the war the market was steadily growing, and in due course the upward movement will no doubt be resumed. The total consumption of iron and steel in India may be put in the neighbourhood of a million and half tons, and of steel only at about a million tons. These figures, however, include a considerable amount of machinery, hardware, motor cars, etc., which are not likely to be produced in India for many years to come. Nevertheless, the market is already large and, with the expansion of demand which may be expected in the next ten or fifteen years provided there is an adequate extension of transport facilities, there would be room for two or three steel works each with an output comparable to that of the works at Jamshedpur.

The Fiscal Commission's second condition. Necessity of protection for development of the steel industry.

27. The second condition laid down by the Fiscal Commission is in some respects the most important of all. If the other conditions are satisfied, the only admissible inference is that protection is legitimate, if necessary, but the question of necessity is still open. It has been the main object of our enquiry to ascertain whether the steel industry can be established in India without protection, and the greater part of this report is devoted to setting forth the facts on which the answer to the question must be founded. It is not necessary at this stage that we should do more than state the conclusion at which we have arrived. At the present level of prices and with the present cost of production, the

manufacture of steel at Jamshedpur is unprofitable and involves a heavy loss. There is every hope that, in the course of three or four years, production costs will be substantially reduced, owing to the adoption of a new process of manufacture and the provision of an up-to-date and efficient plant. But there must be an extremely difficult transition period during which assistance is specially necessary. It is not a question of inability to pay dividends on an excessive capital, but of inability to manufacture and sell steel except at an actual loss. If the efforts of the firm which has been the pioneer of steel manufacture in India were to end in disastrous failure, it would be idle to hope that fresh capital would be forthcoming, and all prospect of further development for the next ten or fifteen years would be at an end. We had it in evidence from Mr. Fairhurst that the Indian Iron and Steel Company would not under present conditions consider the question of embarking on the manufacture of steel unless protection were given, and Mr. Tarlton, giving evidence on behalf of the United Steel Corporation of Asia, stated that without protection it would be impossible to raise the capital required for a fresh enterprise. Our deliberate opinion is that, without the help of protection, the steel industry is not likely to develop at all.

The Fiscal Commission's third condition. Eventual ability of the steel industry to exist without protection.

28. The third question we have to answer is whether the steel industry is one which will eventually be able to face world competition without protection. We have no hesitation in answering it in the affirmative. As we have pointed out, India can already produce pig iron more cheaply than other countries. The process of steel manufacture is admittedly much more difficult, and years must elapse before Indian labour acquires the necessary skill and experience. But India's natural advantages are so great that we believe it will not be long before the initial difficulties are overcome, and steel is produced at a cost low enough to enable it to face outside competition in India without protection.

Importance of the steel industry on national grounds.

29. Before quitting this branch of the subject we must advert briefly to one aspect which is of paramount importance. In paragraph 106 of their Report, the Fiscal Commission discussed the treatment of industries essential for national defence or of special military value, and affirmed without hesitation the principle that "any industry which is essential for national defence and for which the conditions in India are not unfavourable should, if necessary, be adequately protected irrespective of the general conditions which we have laid down for the protection of industries". In the next paragraph they observed "In the first place there is the steel and iron industry.

There can be no question of its importance for purposes of national defence, and there appear to be no natural obstacles to its development in India." On the basis of these statements the case for protecting steel appears to us to be overwhelmingly strong. The extreme importance on national grounds of the existence of steel manufacture in India was demonstrated over and over again during the war, and it is unnecessary to recapitulate facts which are common knowledge. If, in accordance with the principles laid down by the Fiscal Commission, the protection of steel is not held to be justified, we are at a loss to imagine what industry could possibly comply with them. It is impossible to conceive a stronger case.

CHAPTER III.

General Principles underlying the Scheme of Protection.

General principles of the protective scheme.

30. In the last Chapter we have described the natural advantages which India possesses for the manufacture of iron and steel,—advantages great enough to warrant the belief that the Indian steel industry will eventually be able to face world competition without protection. We have still to give our reasons for holding that without protection the industry may cease to exist and will certainly not develop for many years. But before we enter on this branch of the subject, it is desirable that we should state briefly certain general principles which have guided us in our consideration of the subject, and which underly all our recommendations. They are as follows :—

(1) The answer to the question whether protection is necessary depends in the main on the difference between two prices :

(*a*) the price at which steel is likely to be imported into India from abroad, and

(*b*) the price at which the Indian manufacturer can sell at a reasonable profit.

(2) If protection is found to be necessary, and the advantages to be derived from it are held to outweigh any objections which may exist, then the measures taken must be adequate to secure their purpose.

(3) The scheme of protection should be so adjusted as to interfere as little as possible with those kinds of steel which are not manufactured in India at present and are not likely to be manufactured in the near future.

Difference between prices.

31. The first point referred to in the last paragraph need not detain us long. It is, indeed, obvious that the need for protection exists in so far as the Indian manufacturer, selling his steel in competition with imported steel, fails to realize a fair profit or incurs an actual loss. We have mentioned the point specially here both because, in our opinion, the

difference between the two prices is the natural measure of the amount of protection required and because it affects one of our subsidiary proposals referred to in this Chapter (see paragraph 36, below).

Protective measures must be adequate to secure their purpose.

32. We desire to lay great stress on the second point. The immediate object of the scheme of protection is the preservation of the industry as it exists at present. Its remoter, but equally important, object is to attract capital to the industry and promote the development of India's natural resources. From both points of view the protection given must be adequate. The immediate needs of the industry must determine the amount of protection to be accorded at the outset, but the future of the industry must also be considered. The object in view will not be attained if steel manufacture in India continues to be the monopoly of a single firm, for, unless there is internal competition within the tariff wall, the stimulus to economical production disappears. It is far from an extravagant ambition that within fifteen or twenty years India should be able to provide the whole of her domestic requirements of most kinds of steel, and should be able to produce at as low a cost as other countries. It is this result which would finally justify the demand for protection, but it will not be achieved unless the capitalist judges that the price he is likely to obtain gives him a reasonable profit, and unless he believes that protection for the steel industry has become the recognized policy to which Government will adhere. It may not be possible under existing conditions to retain any one rate of protection for a lengthy period. Industrial conditions have been profoundly disturbed by the war, and all forecasts of the course of world prices are likely to be falsified. Long views are impossible, and tariff duties which give reasonable protection when first imposed may, in the course of a year or two, prove inadequate or excessive. Precisely for this reason it is important that the policy should be clearly laid down. Unless protection is adopted as the result of a deliberate decision of Government and the Legislature to encourage the development of the steel industry in India, it will not be easy to enlist fresh capital in the business. The capitalist must look for an assurance that protection will be continued to the extent necessary for the full period which must elapse before anticipations can be tested by results. From the date when a new firm decided to establish steel works, five years would probably elapse before steel was actually manufactured, and another five years before the success or failure of the venture could fairly be estimated. In these circumstances continuity of policy is essential, and it seems to us desirable that the policy should be clearly declared in the preamble to any legislation which is undertaken.

33. The uncertainty of the future course of world prices makes it necessary to buttress the scheme in another way. We have said that the natural measure of the protection required is the difference between the price at which foreign steel enters India and the price which gives the Indian manufacturer a reasonable profit. But that difference may vary either because of changes in the cost of production or, much more frequently, because of fluctuations in the import price. If the rate of protection requires revision because of changes in production costs, that is clearly a matter which should be settled by the Legislature after a full enquiry. If again, circumstances have changed owing to a rise in the price of imported steel, no authority other than the Legislature should have power to reduce the tariff duties, and in this case also a full enquiry would be desirable. But when a marked fall occurs in the price of imported steel an immediate remedy may be necessary, and we think the executive Government should have power to apply that remedy at once, for, if the intervention of the Legislature were necessary, much mischief might be done before action was taken. If the measures adopted are to be adequate for their purpose this contingency must be provided for.

Necessity that Government should have power to make the protection given effective.

34. The danger of foreign steel entering India at abnormally low prices is, we believe, a real one. Since 1921 the cheapest imported steel has come from Belgium, though, in 1922 at any rate, part of it may have originated in Germany. During the last few months there has been a rapid increase in the French production, and it is quite possible that France may become a more formidable competitor in the world's steel markets than she has hitherto been. The results of the resumption of steel production in Germany on a large scale, if and when a settlement of the reparations problem is attained, might of course be serious, and the menace of the release of the Ruhr stocks has not yet been finally dispelled. Under these conditions wide and sudden fluctuations in the price of steel are not improbable.

Danger of invasion of the Indian market by cheap steel from abroad.

35. We have considered the legislation adopted in other countries to guard against similar dangers, but we have not found it possible to frame our proposals on the model of any of them. In such measures the executive Government is usually empowered to take action when the fall in prices is due to some particular cause, *e.g.*, the depreciation of the exchange, the grant of bounties or the low cost of production in the country of origin. But, if the end in view is to secure to the domestic manufacturer a reasonable price, the causes which have enabled

Necessity for complete powers to impose additional duties.

the foreign manufacturer to send his steel into India at lower prices are really irrelevant. If economic conditions in the world generally were more stable, it might be possible to dispense with additional safeguards or to limit them to particular dangers. But, things being as they are, we believe that special powers are necessary, and that they should be complete and not hedged about with restrictions.

Measures proposed.

36. The power which we propose should be conferred on the executive Government in any legislation undertaken to give effect to our proposals may be defined as follows.

If the Governor General in Council is satisfied, after such enquiry as he considers necessary, that steel is entering India from abroad at such prices as are likely to render the protection given by this Act ineffective, he may impose such additional duties as in his judgment are required.

It will be seen that the only point to be determined by enquiry would be the prices at which steel was actually entering India, and these would be compared with the assumed prices taken as the basis of the protective duties determined by the Act itself (*vide* paragraphs 45 and 97 below). Arrangements would be necessary at the Customs Houses in the principal ports to record from the invoices the actual prices at which protected goods were being imported, and if this were done it should be possible to complete the necessary enquiries promptly. It would then rest with the Government of India to decide whether a case for the exercise of their special powers had been made out. A comparatively small decline in the price, or a fall likely to be of very short duration, might not be a sufficient ground for taking action. But the power to act when necessary should be unfettered.

Supplementary provisions.

37. We do not propose at this stage to develop the details of the scheme further, but two points may be mentioned—

(1) The actual enquiries might, we think, be made at the ports by the Collectors of Customs who would report to the Government of India through the Board of Inland Revenue.

(2) The power given should be capable of exercise in the case of imports from all countries, or in the case of imports from a particular country or countries.

Main object to be attained.

38. Legislation of the kind proposed is often described as "anti-dumping", but we have deliberately refrained from making use of that word. Whatever the precise meaning of "dumping"

may be, it always carries with it a suggestion that the "dumpers" are guilty of some degree of moral obliquity, and may therefore justly be penalized. We prefer to rest our case on other grounds. Whatever the reasons for abnormally low prices may be—whether bounties in the country of origin, specially reduced freights, a depreciation in the exchange of a particular country, a rise in the value of the rupee as compared with other currencies, or the sale of steel at unremunerative prices—the effect on the Indian market is precisely the same. It is this effect which has to be dealt with, if the protection given is to be effective.

Avoidance of interference with steel not produced in India.

39. On the third point mentioned in paragraph 30 a few words will suffice. The policy laid down for our guidance is that of discriminating protection which restricts the burden on the consumer to the minimum necessary to attain its object. It follows that those kinds of steel which are not produced in India at present, or are not likely to be produced in the near future, should, as far as possible, be left untouched. We mention the point here because we desire to make it plain that this consideration has been present to our minds throughout our enquiry. To put it very briefly, there is no need for protection unless there is something to protect.

CHAPTER IV.

Prices of Imported Steel.

Course of steel prices before and after the war.

40. It is necessary for our purpose that we should describe briefly the course of steel prices during the last few years. In the last three years before the war the f. o. b. price of imported rails was about £6 a ton, structural sections and plates a few shillings higher, galvanised sheets about £12 a ton, and the average f. o. b. price of continental mild steel bars about £5-10 a ton. The landed prices in India may be taken at about £1 a ton above these figures. During the war the importation of steel from abroad was extraordinarily difficult, and such steel as was available naturally commanded a very high price. War prices, however, have no special significance for our purposes and need not be discussed. After the cessation of hostilities steel prices fell heavily in the earlier part of 1919, but later in the year a recovery began which became more rapid as it proceeded, and during 1920 unheard-of levels were attained. The Great Indian Peninsula Railway, for example, paid £17-10 a ton (f. o. b.) for imported rails in 1920-21, and the Bombay, Baroda and Central India Railway from Rs. 340 to 350 a ton (c. i. f.) for imported structural shapes. Continental mild steel bars again were quoted as high as £29 a ton c. i. f. Bombay in November 1920, and the market quotations in the United Kingdom rose to £24 a ton for beams and common plates and to over £50 a ton for galvanised sheets. The boom was not of long duration, however, and the fall of prices in 1921 was as rapid as the rise had been. Throughout 1922 and 1923 prices have continued at a low level, the only changes of importance being—

(*a*) A sharp rally in prices for a few months during the spring of 1923 after the occupation of the Ruhr, followed by a gradual decline though not quite to low-water mark.

(*b*) An appreciable increase in British market quotations for steel apparently due to prospects of better trade at the end of 1923.

Lowest level of prices.

41. The low level which prices have touched are indicated by the following quotations :—

	c. i. f. price per ton. Rs.	
Rails . . .	133·8	Imported by the Bengal Nagpur Railway in 1923, the order having been apparently placed in 1922. The f. o. b. price was £7-10-0 a ton.

	c. i. f. price per ton. Rs.	
Angles	133	Imported by the Bombay, Baroda and Central India Railway in 1923.
Channels	132	
British beams	139	Imported by Messrs. Richardson and Cruddas in 1922.
Continental mild steel bars.	108	Imported by Messrs. Trivedi and Co. in November 1922.
Galvanised sheets	280	The average British market quotation in 1922 was £17-5-0 a ton. The price given is the equivalent c. i. f. price after allowing for freight, insurance, etc.

Comparison with pre-war prices.

42. The figures given in the last paragraph compare as follows with pre-war prices, taking the latter as Rs. 100 in each case :—

Rails	125
Angles and Channels	120
British beams	125
Continental bars	110
Galvanised sheets	146

It is noticeable that the price level is highest where the British manufacturer has least to fear from continental competition, *i.e.*, in the case of galvanised sheets. In the case of most commodities post-war prices are still at least 60 per cent. above pre-war prices, and the fact that steel prices have temporarily settled down at a much lower level is significant.

Reasons for low level of steel prices.

43. The explanation of the low range of steel prices is not really obscure. More economical methods of manufacture will account for part of it, and the establishment in Belgium and Northern France of thoroughly modern and up-to-date plants in place of those destroyed during the war. Something must also be attributed to the general depreciation of the continental exchanges, though we do not rate this influence very high except as a temporary factor. But in the main, the explanation is to be found in an immense decrease in the world's consumption of steel, coupled with a simultaneous increase in steel manufacturing capacity. This broad statement is, of course, subject to qualifications. The production of steel ingots and castings in the United States of America has risen from about 31 million tons in 1913 to about 44 million tons in 1923, but in that country consumption and productive capacity have increased together, and steel exported from the United States is not at present an important factor in the world's export markets. But if the United

States be excluded, the world's steel production has dropped* from 44 million tons in 1913 to 28 million tons in 1923. It is estimated that the British plant is capable of producing about 50 per cent. more than before the war. The productive capacity of the steel works on the Continent of Europe has also risen substantially, but owing to territorial redistributions there has been a great transference from Germany to France. The latter country in 1922 and 1923 produced nearly the same quantity of steel as in 1913, and Great Britain about 800,000 tons more. Belgium was just short of pre-war production, while Germany of course has produced only a fraction of its output in 1913.

Recent British prices unremunerative.

44. The figures show that in 1922 and 1923 the world's consumption of steel (excluding the United States) was less than two-thirds of the pre-war rate, and in these circumstances the keenest possible competition for the available markets was inevitable. In the written and oral evidence we have taken we have heard much of 'dumping', but the use of this word does nothing to illuminate the subject. Unquestionably the British steel manufacturer has been selling steel for export at lower prices than he accepts from British purchasers, and probably Continental manufacturers follow the same practice, as the Indian manufacturer of pig iron certainly does. But we have received no evidence which suggests that any deliberate policy of cutting prices is being pursued with the object of killing the industry in India. The steel manufacturer, whether British or Continental, is striving for the highest price he can get and, if he accepts a low price, it is because he must endeavour to keep his works occupied even if that means sacrificing all profits.† The lowest prices that have been touched are not remunerative and the evidence we have taken suggests that, when the price of the ordinary kinds of rolled steel in the United Kingdom falls appreciably below £8 a ton, the margin of profit is near the vanishing point for most manufacturers. It is evident indeed from the published reports of many iron and steel making firms that, at the present level of prices, steel manufacture is carried on under the greatest difficulties, and that many orders are taken at rates which leave no profit at all or even involve a loss.

Prevailing prices of steel in the latter half of 1923.

45. We have endeavoured to ascertain the prices at which steel of those kinds which are manufactured by the Tata Iron and Steel Company actually entered India without duty in the latter half

* These figures are taken from the Iron Trade Review of Cleveland, Ohio as quoted in the "Economist" of January 5th, 1924.

† It is noteworthy that when Continental competition dropped after the occupation of the Ruhr, the gap between British internal and export prices at once closed up.

of 1923 and our estimate is contained in the following statement in which the tariff valuations for 1924 are given for purposes of comparison :—

	Tariff Board's Estimate. Per ton. Rs.	Tariff Valuation 1924. Per ton. Rs.
Steel bars and rods, ordinary—		
½ inch and under in diameter . . .	140	150
Other sizes		135
Structural shapes, *i.e.*, angles, beams, channels, etc.	145	150
Rails, 30 lbs. and over	140	...
Plates, ordinary	150	150
Sheets, black	200	175
Sheets, galvanised	300	300

Our estimate is based on quotations in the trade periodicals, corrected in accordance with the record of prices in particular transactions, where these were available, with quotations obtained by importing firms and with general information bearing on the reliability of the public quotations. For steel of those kinds which are usually imported from England, *e.g.*, rails and sheets, the English prices were allowed most weight, while in other cases, some importance was given to Continental prices, chiefly Belgian. The other components of the Indian price—freight, insurance, landing charges, etc.—are based on the quotations in the Monthly Market Report, August 1923, for the kinds of steel in question. Lower freight rates appear occasionally to have been obtained towards the end of 1923 than those of August, but there is no indication of any permanent decline in freights. All prices have been converted into Indian currency at Rs. 15 to the pound sterling.

Future course of steel prices.

46. The difficulty of forecasting the future course of prices is obvious. They must be profoundly influenced by political factors which are wholly incalculable and the interaction of the various elements of the problem is of extreme complexity. There are, however, two influences tending in opposite directions which should be noted—

(1) Prices can hardly remain for a long period at the lowest level because manufacturers cannot continue indefinitely to produce steel at unremunerative prices.

(2) Any revival of trade which substantially increased the demand for steel would at once bring into play a good deal of plant which is now lying idle or is only partially employed. This would operate to retard any general advance in the price level.

Prices given in paragraph 45 the basis of the Board's recommendations.

47. We have taken the prices given in paragraph 45 as the basis of our recommendations. They are above the lowest figures at which steel has actually entered India in the last two or three years, and it is quite possible that they may again fall to the same level. Should such a relapse occur and persist for any prolonged period, the situation must, we consider, be dealt with by the exercise of the special powers which we have proposed (Chapter III above) should be conferred on the Government of India. On the other hand, we have considered whether, having regard to the recent rally of steel prices in Great Britain, the basic prices we have given should be raised. We do not find, however, any sufficient reason for a modification of this kind. It is doubtful whether the higher British prices are likely to be permanent, nor is it clear whether export prices have risen to the same extent as internal prices. There is no evidence, moreover, that there has been any corresponding change in steel prices on the Continent of Europe, nor is there any indication that competition from that quarter is likely to be less severe in the future than it has been in the past. The average prices likely to obtain during the next two or three years should be somewhat above low-water level, but there is as yet no evidence which would justify the belief that a general and permanent recovery of prices is imminent.

The estimate of the imported price of bars requires some further explanation. Most of the bars manufactured by the Tata Iron and Steel Company are made to fulfil definite specifications and therefore, for much engineering and constructional work, command a higher price than the ordinary Continental bars which are commonly sold without any definite guarantee of quality. On the other hand, the Indian product already competes with Continental bars in markets where it has an advantage in internal freight charges and will do so to a greater extent as production increases. But the total estimated output is only 45,000 tons, whereas the present annual Indian consumption is about 155,000 tons, and the Indian producer, therefore, can only hope to command a part of the market. In these circumstances we took as our estimate of the price of imported bars a figure distinctly above the lowest prices at which Continental bars are likely to come in, but also below the full price of Standard English bars. It may be that the increase in the price of bars, due to the imposition of a higher duty, would lead to a more extensive use of the cheaper Continental bar in place of the standard British bar, and so restrict the market for the Indian product. In that case it would be necessary to adopt a lower price than Rs. 140 a ton as the price at which bars were likely to be imported into India without duty. But we do not consider it necessary to provide for a contingency that has not yet

arisen, and for this reason we have adhered to Rs. 140 as the basic price of imported bars for our purposes. So long as the annual output of bars at Jamshedpur is less than 50,000 tons, it is not necessary that the Indian product should compete successfully with Continental bars in every Indian market or in all circumstances.

CHAPTER V.

Cost of producing steel at Jamshedpur in 1921-22.

The three elements in the selling price.

48. In the last Chapter we gave our conclusions as to the price at which steel is likely to enter India from abroad. We now turn to the second price which is fundamental in our scheme, *viz.*:—the price at which the Indian manufacturer can sell steel at a reasonable profit. Before it can be determined, it is obviously necessary to investigate the cost of production, which includes both the works costs and the overhead charges. The works costs cover all purchases of material, and all wages and salaries paid at Jamshedpur and at the ore mines and limestone quarries, but not similar payments at the Company's coal mines which for this purpose are treated on a semi-independent footing, the coal brought to Jamshedpur being charged at an all-round rate sufficient* to cover the raising cost at the mines. The other charges, which have been classed as overhead, include—

(a) Interest on the manufacturer's working capital.

(b) The expenses of the head office and the Agents' commission.†

(c) Depreciation.

The third element in the selling price is the manufacturer's profit, and before this can be ascertained, a preliminary analysis of the capital account is essential. These three factors (*a*) works costs (*b*) overhead charges and (*c*) the manufacturer's profit will form the subject of this Chapter and the next.

The costs of 1921-22 and comparison with those of 1916-17.

49. We have found it advisable to divide our examination of this branch of the subject into two stages. The first step is to ascertain the cost of producing steel in India under post-war conditions in the Company's old plant which has been in operation since 1912, and for that purpose to select for detailed study the accounts of one particular year. It would

* See paragraph 84 below.

† The head office of the Tata Iron and Steel Company is located in Bombay and the agents are Messrs. Tata & Sons, Limited. Charges of this kind must be incurred by any firm manufacturing steel in India, and the system of Managing Agents is an integral part of the Indian industrial organization as it exists at present.

have been natural to utilize the figures of the last complete year (1922-23), but we were unable to do so because—

(1) The results were seriously affected by the general strike at the works which brought the manufacture of steel to a standstill for nearly six weeks, and

(2) Complications were introduced by the fact that in 1922-23 certain portions of the new plant had begun to work but were not in full operation, *e.g.*, one of the tilting steel furnaces, the plate mill and the Wilputte coke ovens.

Of all the post-war years, 1921-22 was least affected by labour troubles, and the only part of the new plant then in operation was the third blast furnace. We have therefore concentrated our attention upon it. It was necessary also to investigate the reasons for the continuous increase in the cost of production during the last six or seven years, and for comparative purposes we selected the year 1916-17, when the cost of production was the lowest in the history of the Tata Iron and Steel Company. It is the works expenditure which is chiefly in issue in this comparison, but we have extended it to the overhead charges also, partly for the sake of completeness, and partly because in the tabular statements, in which the case for the Company was first presented, the rise in the overhead charges per ton was a very noticeable feature. The cost of production in 1921-22 will be discussed in this chapter on the lines indicated above.

Future cost of production from 1921-22 onwards.

50. The second stage has reference to the future rather than to the past. Conditions have changed to some extent since 1921-22, and it would be necessary in any case to bring that year's figures up to date. But the most important change is the approaching completion of the new plant comprised in the extension scheme, which from 1924-25 onwards will be responsible for the greater part of the output of iron and steel. This is an entirely new factor for which, under whatever difficulties, allowance has to be made in our recommendations. The cost of production and the reasonable selling price under the conditions likely to prevail during the next two or three years form the subject of Chapter VI. Both this chapter and the next are concerned with similar problems, but in the latter it has proved convenient to reverse the order in which the topics are discussed. In dealing with the figures of 1921-22 we have commenced with the works costs, where the facts were most readily ascertainable, and then handled in succession the overhead charges and the manufacturer's profit. But looking to the future, we have felt constrained to take first the capital cost of the extension scheme, both because of the

suggestion frequently made that the purchase of the new plant at a time of high prices is the main reason why the Company are unable to sell steel at a profit in competition with imported steel, and because the cost of operating the new plant is necessarily a matter of conjecture rather than of ascertainable fact.

Works Costs.

Works costs of 1921-22. The cost of coal.

51. We now turn to the works costs of 1921-22 as compared with those of 1916-17. The following table compares the most important figures of the two years :—

—	Works cost per ton 1916-17.	Works cost per ton 1921-22.	Percentage of increase.
	Rs.	Rs.	
Pig iron	18·54	34·47	86
Steel ingots	41·13	68·82	67
Rail mill products . . .	75·17	116·00	54
Average cost of all finished steel . .	77·23	120·41	56

It will be seen that the increase is highest in the case of pig iron, the stage of manufacture at which the cost of coal is the main factor. Between 1916-17 and 1921-22, the cost of coal at Jamshedpur rose from Rs. 3·8 to Rs. 8 a ton, while simultaneously the quality deteriorated, the percentage of ash in the coke rising from about 20 to 24. The immediate result* was an increase of Rs. 8·4 in the cost of pig iron, or more than half the total increase. Only half the coal employed at the works, however, is coking coal, and the price of the other half directly affects the latter stages of manufacture. Out of a total increase of Rs.41 per ton in the cost of rails, coal is responsible for at least Rs. 18. The other main factors affecting costs at all stages were—

(1) An increase in the wages of labour at Jamshedpur of between 40 and 50 per cent. Higher wages at the ore mines and limestone quarries similarly raised the cost of essential raw materials.

(2) A general increase in the price of all purchased materials and consumable stores.

* The figure given in paragraph 11 will serve to show how an increase in cost at one stage is carried on to later stages. In 1916-17 only 1·66 tons of coking coal were required to make a ton of pig iron and in 1921-22, 1·78 tons. Had the quality of the coal not deteriorated, the rise in the price of coal would have increased the cost of pig iron by about Rs. 7·5 a ton only.

Costs in the steel furnaces and mills.

52. The number of steel furnaces in operation was four in 1916-17 and seven in 1921-22, but the outturn of ingots only rose from 139,000 to 182,000 tons. There was therefore a marked decline in the outturn per furnace. During the war the demand for steel was intense, and quality was sacrificed in order to secure the largest possible outturn. After the war the Company found it necessary to make sure of the quality even at the cost of a heavily reduced output per furnace. This decline in the average output necessarily raised the cost of operating the steel furnaces. The mills, on the other hand, had a much larger quantity of ingots to deal with and the higher output tended to keep costs down.

Increase in works costs between 1916-17 and 1921-22 fully explained.

53. We are satisfied that the increase in works costs between 1916-17 and 1921-22 was due to perfectly definite causes which in the main were beyond the control of the Company, and was not due to any loss of efficiency in the management. Our conclusion is based on a careful scrutiny of the cost sheets of both years, and it is not necessary to burden this Report with a minute examination of details. But the labour charges, the rise in the price of coal and the reduced output of the steel furnaces require separate discussion.

Labour costs. Statements furnished by the Company.

54. The increases in wages granted at Jamshedpur during the last five or six years do not seem to be higher than those granted in other industries, nor are they disproportionate to the rise in the cost of living. There still remains, however, the question of numbers. A statement handed in by the Company at an early stage of our enquiry suggested that there had been an extraordinary decrease in the output per head in almost every department, and that the number of labourers employed had become extravagantly large. Subsequently, however, the Company was able to show that the figures were erroneous* and that there had not in fact been any marked increase in the number of the labour force, except to a limited extent in the coke ovens and the blast furnaces. The necessity of putting men in training to work the additional plant about to come into

* Owing to a change of system in the accounts in 1918-19, the figures for the labour strength in the two years cannot be compared. A number of labourers are attached permanently to the Traffic department and employed in the works from time to time on miscellaneous duties wherever they may be wanted. Up to 1918-19, these men were entered on the engagement rolls of the Traffic department although their wages were debited to the department in which they worked. From 1919-20 onwards they were shown as serving in the department to which they were attached.

operation made some temporary increase in numbers inevitable, and the larger quantity of surplus pig iron available for sale (107,000 tons instead of 40,000) involved the employment of more men at the blast furnaces, owing to the extra handling required by the cold pig on its way to the market, as compared with the hot metal transferred direct to the steel furnaces.

Labour costs. Covenanted hands.

55. The labour cost per ton of finished steel at Jamshedpur is unquestionably higher than the corresponding cost in western countries. This is due not only to the higher wages paid to the skilled labour imported from abroad, but also to the much larger number of unskilled and semi-skilled labourers employed, so that the total wages per ton come out higher. The total wages of the covenanted men employed in 1921-22 in the five* important producing departments was Rs. 9·5 lakhs. Mr. R. D. Tata informed us in the course of the oral evidence that the wages of Indians appointed to similar posts would probably be one-third less, and the eventual saving indicated is therefore over Rs. 3 lakhs, or, if allowance be made for the covenanted hands in other departments, Rs. 4 lakhs. The incidence of the sum of Rs. 9·5 lakhs mentioned above is about Rs. 6 per ton of finished steel, and the extra cost as compared with western countries is about Rs. 2 per ton. This is a handicap which will diminish as time goes on and Europeans and Americans are replaced by Indians. Good progress in this direction has already been made. The number of covenanted men employed in each department in 1912-13 and in 1921-22 compares as follows :—

	Number of covenanted men employed.	
	1912-13.	1921-22.
Coke ovens . . .	6	0
Blast furnaces . .	28 on 2 furnaces.	8 on 3 furnaces.
Steel furnaces . .	68 on 4 furnaces.	43 on 7 furnaces.
Mills	38	23

Cost of unskilled and semi-skilled labour.

56. The question of the unskilled and semi-skilled labour stands on a different footing. In the steel industry, as in other industries in India, low paid labour is not cheap labour and the number of men employed is naturally much higher than in western countries. We have made full allowance for that fact, and for the effect on the pay rolls of the absenteeism unfortunately too common in this country, but the impression left on our minds, nevertheless, is that the labour staff at Jamshedpur in 1921-22 could

* The blast furnaces, open hearth furnaces, blooming mill, rail mill and bar mill. No covenanted hands have been employed at the coke ovens since 1919.

have been reduced without loss of efficiency. We do not suggest that, even had the strictest economy been observed, the difference in the cost of finished steel would have been more than one or two rupees per ton, and we believe that the Company were hampered in this matter by the grave labour unrest of the last four or five years, and by a natural anxiety to avoid reductions of staff which might easily have led to a strike and a complete stoppage of work. But the matter is of considerable importance, for strict economy is necessary if the industry is to survive. As men are gradually transferred to the new plant, it should be possible to leave some of the vacancies in the old plant unfilled.

The cost of coal.

57. The cost of coal in 1921-22 could not have been reduced. The figure charged in the cost accounts is the price paid 'free on rail—collieries' for purchased coal (Rs. 6·6 per ton) *plus* freight to Jamshedpur. During the same year the Company sold from its own collieries a quarter of a million tons at an average price of Rs. 8·43 a ton. It was therefore purchasing well below the market rate.

Reduction on the output of the steel furnaces.

58. We have no doubt at all that the Company were right when they decided after the war that a high standard of quality was essential, even if the outturn of steel declined heavily. The whole future of the industry depended on their ability to prove that steel of thoroughly sound quality could be produced in India. This has now been done, and the outstanding problem is to combine quality with a higher output. For climatic reasons this is a more difficult task in America* than in England, and more difficult in India than in America. During the hot weather months it is a very arduous business for the man in charge to keep the close watch over the furnaces which is essential. Nevertheless, we believe that in the stationary open hearth furnaces a higher output is possible and will be secured. When the new plant is in operation the Company will be making a larger variety of products, and the same uniformity in the composition of the steel ingots will not be necessary. Steel that is too soft for structural shapes may, for example, be used for sheets. It will also be possible to use more steel scrap in the metallic mixture, and thus diminish the total quantity of impurities to be removed and the time taken in their removal. Improvements in the quality of the refractory materials used will reduce the periods when the furnaces are closed down for repairs. Finally the duplex process, which is to be adopted in the new plant in place of the stationary open hearth furnaces, is expected to lead to a much higher output of steel ingots.

* Both in America and in India the furnace fronts are water-cooled, a measure which is not usually considered necessary in Europe.

Conclusions regarding works costs in 1921-22.

59. Our general conclusion regarding the works costs at Jamshedpur in 1921-22 is that, in all the circumstances, they were reasonable and that, subject to what is said in paragraphs 54 and 56, they could not have been substantially reduced. Much of the old plant, and particularly the rolling mills, is no longer up to date and is unquestionably expensive to operate. Again, while we believe that better results will eventually be secured from the open hearth furnaces, we find no justification for holding that these could have been obtained two years ago. The steel industry in India is still in its early adolescence, a period when experience has to be purchased, and economical production is largely a matter of experience. Finally, the Company are in no way responsible for the heavy increases in prices and wages nor for the time when they occurred. It is sometimes forgotten that, whereas in Europe wages and prices increased during the war and have fallen heavily since 1920, in India most of the increase took place after hostilities had ceased. It is this fact which supplies the answer to those who complain that the cost of steel production in India was still rising when in other countries it was falling. The cost of coal at Jamshedpur was still Rs. 5 a ton in 1918-19 and the first increase in wages since 1914 was given in 1919-20.

The Overhead Charges—Analysis of the Capital Account.

Necessity for preliminary analysis of the capital account.

60. We now turn to the other elements in the costs of production. Before we could determine the overhead charges in 1921-22, we found it necessary to make a close analysis of the capital account. The Company had already expended very large sums on the extension scheme, and part of the share capital raised in order to finance the scheme was entitled to dividends. It by no means follows, however, that the whole of that capital had contributed to the production of iron and steel in 1921-22 or could be taken into account in the costs of that year. The figures originally put forward by the Company we were unable to accept, and we found it necessary to proceed on independent lines. Our final conclusion is that a sum of Rs. 400 lakhs is a fair estimate of fixed capital expenditure corresponding to the production of 1921-22, and we shall explain how this figure was arrived at.

Exclusion of the capital expenditure on the collieries.

61. We found it necessary to exclude in the first place the capital expenditure on the collieries. During the last six years the Company has sold nearly a million tons of coal produced from its own collieries, or more than a third of the total output. Eventually, when development is completed, the company expect to produce about two million tons of coal, while their purchases

under the 25-year contracts will amount to three-quarters of a million tons more or less. The total requirements at Jamshedpur as estimated by the Company are about 1¾ million tons. In the face of these figures the only possible conclusion seems to be that the collieries should be treated as a separate venture, and should be expected to pay their own overhead and provide a return on the investment from their own sale proceeds. Unless the collieries are eliminated, we cannot avoid the discussion of what, for our purposes, is really an irrelevant question, *viz.*, to what extent the capital spent on the collieries is a remunerative investment. At the present rate of output (half a million tons) the collieries do not pay their way, but an output of about three-quarters of a million tons would put them straight.

Fixed capital expenditure excluding collieries.

62. The fixed capital expenditure on the old plant (excluding the collieries, but including the town and the ore mines and limestone quarries) was Rs. 400 lakhs in round figures on the 31st March 1922. This includes three additional open hearth steel furnaces (erected between 1917 and 1920) which must be treated as additions to the original plant and not as part of the extension scheme. Apart from the works proper, a small part of the expenditure (up to 31st March 1922) on the town sanitary works had been incurred in anticipation of the needs created by the extension scheme, but the town buildings were barely adequate for the working population of the year. The total expenditure on the town is not in our opinion unreasonable or in excess of requirements.

Expenditure from the depreciation fund.

63. The book value of the property is Rs. 400 lakhs, but the machinery, buildings and other assets are no longer worth that sum unless adequate provision has been made for depreciation. If depreciation at income-tax rates on the book value of the block had been set aside at the end of every year from the commencement of steel manufacture in 1912, the total amount written off up to 31st March 1922 would have been Rs. 160 lakhs in round figures. The sums actually set aside by the Company are in excess of this figure and have been spent in additions to, and improvements in, the plant, that is to say, on the extension scheme. In these circumstances the value of the property has been fully maintained. The value of the new plant operating in 1921-22 was approximately Rs. 100 lakhs, and the balance of Rs. 60 lakhs spent from the depreciation fund is covered by plant which came into production in the following year. The only item which directly increased production in 1921-22 was the third blast furnace. Its cost was less than Rs. 40 lakhs, and it was responsible for five-sixths of the surplus pig iron (107,000 tons) on which the company

realised a profit exceeding Rs. 50 lakhs. In these circumstances we consider that the sum of Rs. 400 lakhs may be taken as the fixed capital expenditure corresponding to the production of the year 1921-22.

Cost at present-day prices of erecting steel works of the same capacity as those at Jamshedpur.

64. It would be impossible at present-day prices to construct in India a plant with a productive capacity similar to that of the works at Jamshedpur in 1921-22 (126,000 tons of finished steel and 270,000 tons of pig iron) for the sum of Rs. 400 lakhs. We estimate that for this purpose a sum of Rs. 600 lakhs would be necessary if the cost of the ore mines, limestone quarries and the town are included. The higher cost is due not only to the rise in prices since pre-war days, but to the fact that more elaborate and expensive plant is now considered necessary in order to secure economical production. New works erected now would have to provide a return on a higher capital than the Jamshedpur works, but the operating expenditure should be very distinctly lower. The importance of the figure of Rs. 600 lakhs lies in the fact that in fixing the allowance to be made for depreciation, the manufacturer has to be guided not by the book value of his property or its original cost, but by the cost of replacement at present-day prices.

Estimate of the cost of the works to be erected by the United Steel Corporation of Asia.

65. In arriving at a figure of Rs. 600 lakhs as the cost of an up-to-date plant with about the same capacity as the Jamshedpur works in 1921-22, we have considered the estimate prepared in 1922 for the United Steel Corporation of Asia by Messrs. Cammell Laird & Co. of Sheffield who will act as technical advisers to the firm. The Corporation propose to make a start with an instalment (about one-fourth) of their full scheme, and the outturn expected is 140,000 tons of steel and 180,000 tons of pig iron. This estimate comes to just over Rs. 600 lakhs, excluding the reserve for contingencies and any provision for the mines and quarries or for the town. On the other hand the rolling mills, the water and hydraulic system and the power station will be constructed so as to make provision in advance not only for the needs of the first instalment, but, to a large extent, of the complete scheme. The deductions to be made from the estimate on this account are counterbalanced by the additions which must be made on account of the mines and quarries and the town.

The overhead charges.

66. We are now in a position to deal with the overhead charges.

(1) *Interest.*—The figures given in the Company's cost accounts are based on the actual interest paid in each year on

debenture and other loans. On this method of calculation the Company required six times as much working capital in 1921-22 as it did in 1916-17, a result which could not be accepted when the outturn of steel had gone up by only 27 per cent. After a close examination of the subject we were satisfied that Rs. 200 lakhs was approximately the working capital actually required in 1921-22 and that the corresponding figure in 1916-17 was about Rs. 100 lakhs. The increase in production accounts for about one-third of the difference, and the rise in prices between the two years is a sufficient explanation of the balance. In 1916-17 the Company could borrow at 6 per cent., whereas in 1921-22 the rate was 7½ per cent. The total requirements on account of interest therefore were—

	Rs.
1916-17	6 lakhs.
1921-22	15 lakhs.

(2) *Bombay expenses and Agents' commission.*—There is little difference in the Bombay expenses between the two years, but the Agents' commission was Rs. 10 lakhs in 1916-17 and Rs. 3½ lakhs in 1921-22. The amount of the commission depends on profits, and variations in profits are not relevant in an enquiry into costs. We have therefore taken for comparative purposes the 1921-22 figure for these items (Rs. 7·31 lakhs) in both years.

(3) *Depreciation.*—In 1916-17 the allowance for depreciation was Rs. 21·5 lakhs. In 1921-22 the reasonable allowance must, we consider, be determined by the cost at present prices of replacing the old works. The replacement cost we have found to be Rs. 600 lakhs (paragraph 64 above). Depreciation at 6¼ per cent. on this sum amounts to Rs. 37·5 lakhs.

Final comparison of production costs in 1921-22 and 1916-17.

67. The detailed comparison of the results of the years 1916-17 and 1921-22 is as follows :—

	1916-17.	1921-22.
	Rs.	Rs.
Works cost per ton	77·24	120·41
Overhead per ton	32·17	38·24
Total cost per ton .	109·41	158·65

The works cost given above are the averages for rail mill and bar mill products taken together. In order to distribute the overhead charges between steel and surplus pig iron, the output for the year in each case has been multiplied by the works cost per ton, and the charges divided in the same ratio as the one result bears to

the other.* The figures are therefore approximate but we believe they are reasonably accurate.

Manufacturer's Profit.

Manufacturer's profit.

68. We have now to determine the selling price which would have given the Company a fair return on the capital investment. We have found that Rs. 400 lakhs was the capital expenditure incurred and it only remains to determine the rate of interest. The evidence we have taken has satisfied us that the rate on ordinary shares cannot be put at a lower figure than 10 per cent. As for the remainder of the capital, it is not necessary to discuss on abstract grounds what the figure should be, for the best evidence of the rate at which capital can be raised is the rate at which it has actually been raised in the past. The original share capital of the Company—Rs. 231·75 lakhs—consisted of ordinary, deferred and 6 per cent. first preference shares, and the balance of the total of Rs. 400 lakhs consists of 7½ per cent. second preference shares. The details are as follows :—

	Amount.	Rate of interest.	Interest payable.
	Rs. lakhs.	Per cent.	Rs. lakhs.
Ordinary and deferred shares . .	156·75	10	15·67
First preference shares . . .	75·00	6	4·50
Second preference shares . .	168·25	7½	12·63
Total	400·00	8·2	32·80

The average rate of interest on the whole capital is just over 8 per cent., and it is most unlikely that any other company could have obtained the money more cheaply. If the sum of Rs. 32·8 lakhs be distributed between steel and surplus pig iron by the

* The method of allocation adopted may be illustrated from the figures of 1921-22.

	1 Quantity produced.	2 Works cost per ton.	3 Total works cost (1) multiplied by (2).
	Tons.	Rs.	Rs. lakhs.
Surplus pig iron	107,000	34·47	36·88
Finished steel	135,873	120·41	188·45

The total overhead to be allocated is Rs. 59.81 lakhs. If this is apportioned in the ratio of 36.88 to 188.45, the share of the surplus pig iron is 11·68 lakhs and of the finished steel 48.13 lakhs. If the latter figure is divided by the total production of finished steel, the incidence per ton is Rs. 38·24.

method indicated in the last paragraph, the incidence per ton of steel is Rs. 20·96. The average selling price which would have given the manufacturer a fair profit is therefore Rs. 179·61—or in round figures Rs. 180 a ton arrived at as follows :—

	Per ton.
	Rs.
Works cost	120·41
Overhead charges	38·24
Manufacturer's profit	20·96
Total .	179·61

Average price at which steel was sold in 1921-22.

69. In 1921-22 the average price realised by the Tata Iron and Steel Company for all finished steel was Rs. 159 a ton, which just sufficed to cover the overhead charges and left no profit whatever. The average price was, however, affected by the contracts made with the Bengal Nagpur Railway Company and the Companies known as the "Palmer" Railway Companies for the supply of rails and fishplates. If the Companies had paid at the same rates as the Railway Board, the Iron and Steel Company would have received an additional sum of nearly Rs. 17 lakhs which is equivalent to 4¼ per cent. on a capital of Rs. 400 lakhs. The average price obtained for finished steel would have risen by Rs. 13·36 a ton from Rs. 159 to Rs. 172·36.

Average price at which steel was sold in 1922-23.

70. The price of steel was still comparatively high in the early months of 1921, but fell continuously throughout the year. The results of 1922-23 were naturally, therefore, much worse. In spite of the increase in the customs duty from 2½ to 10 per cent., the average price received for all finished steel dropped to Rs. 142·56 per ton. Here also the rail contracts made a substantial difference. Had payment been made in all cases at the Railway Board rates, the average price would have risen by Rs. 10·9 per ton to Rs. 153·46. Even on the 1921-22 costs this meant a loss of Rs. 5·19 per ton. But owing to the increase in the price of purchased coal from Rs. 6·6 to Rs. 8·96 per ton, there had been an increase in 1922-23 of approximately Rs. 9·5 in the works cost of steel, and the loss was raised to Rs. 14·69 per ton. It is evident, we think, that at the present level of prices and with the present customs duties the manufacture of steel in India can only be carried on at a loss.

CHAPTER VI.

Future cost of production and price which will enable Indian manufacturer to sell at a reasonable profit.

Preliminary. The capital account.

71. As indicated in paragraph 50, we shall discuss in this Chapter the cost of production at Jamshedpur when the new plant is in full operation, *i.e.*, from 1924-25 onwards, and for the reasons given there we shall begin with the capital account. It has frequently been suggested that, if the construction of the new plant had been postponed until prices had reached their normal post-war level, the capital expenditure incurred would have been much lower, and that then there would have been no difficulty in selling steel at a profit in competition with imported steel. We have examined closely the question how far the capital account has been swollen by purchases at a time of high prices, and we shall set forth the results of our enquiry. But it is perhaps worth while to make two points clear at the outset. We have already shown at the end of the last Chapter that the manufacture of steel in the old plant at Jamshedpur in 1922-23 involved a heavy loss, and the same is true of 1923-24. Had the Greater Extensions been completed in 1921, as the Company originally hoped, they would have been much better equipped to face the period of low prices. In the second place, if the commencement of the extension scheme had been postponed till 1922, it is more than likely that the steel works would have closed down before now. But for the profits made on the surplus pig iron during the last three years, the manufacture of steel at unremunerative prices could hardly have continued. But the surplus pig iron was produced by the new blast furnaces which are an integral part of the extension scheme, and if there had been no extensions there would have been very little pig iron to sell. The purchase of the third blast furnace (sometimes called the Batelle furnace) has been specially criticized on the ground that it cost much more than it was worth. It is a sufficient reply to this criticism to point out that it cost less than Rs. 40 lakhs and more than paid for itself in a single year by the profits on the surplus pig iron it produced.

The Capital Account.

Capital account on 31st March 1924.

72. By the 31st of March 1924, the works included in the extension scheme will be practically complete, and the whole of the new plant will come into operation in 1924-25. The fixed capital expenditure of the Company will then, it is estimated,

amount to Rs. 21 crores*. We have no hesitation in saying that this sum is greatly in excess of the present value of the property, whether regard be had to the profits which might be earned, or to the cost of replacement at present-day prices. It is necessary, however, to deduct in the first place the capital expenditure on the collieries (Rs. 205 lakhs), and second depreciation at income-tax rates on the whole plant up to the 31st March 1924 (Rs. 245 lakhs). The balance is Rs. 16½ crores, and the real question is to what extent this figure exceeds the cost at present-day prices of constructing iron and steel works with a similar output. Unquestionably the new plant was purchased during a period when prices were very high, and the natural inference is that it could be purchased much cheaper to-day.

Estimated cost of the iron and steel works projected by the United Steel Corporation of Asia.

73. The best evidence available of the probable cost of erecting in India works with a productive capacity of over 600,000 tons of pig iron and over 400,000 tons of finished steel is the estimate for the complete scheme contemplated by the United Steel Corporation of Asia. It amounts to Rs. 15½ crores including, and Rs. 15 crores excluding, the development of the Corporation's coal mine. So far as the technical equipment is concerned the estimate was prepared by Messrs. Cammell Laird and Co., and brought up to date on the basis of 1922 prices. The output expected—700,000 tons of pig iron, of which 100,000 tons will be surplus, and 450,000 tons of finished steel—is rather higher than the output expected at Jamshedpur, but the two schemes are comparable. Indian experience in connection with estimates does not justify the belief that the actual expenditure incurred on the Corporation's plant would be appreciably smaller than Rs. 15 crores.

American purchases for the new plant at Jamshedpur.

74. In so far as the question can be investigated in other ways, the evidence tends to support the figure of Rs. 15 crores as the probable cost to any firm of works similar in magnitude to those of the Tata Iron and Steel Company. The data available are very imperfect, but they give some assistance. The new plant at Jamshedpur was purchased almost entirely in America and the total orders placed amounted to 21,307,367 dollars. The remittances were made at an average rate of Rs. 3·22 to the dollar, and the American purchases amounted therefore to nearly Rs. 7 crores, which is about half the total cost of the extensions. We have not been able to ascertain the changes in the prices of plant and machinery in America during the last

* If the Company's investments be added, the total is about Rs. 22 crores. Clearly, however, the investments must pay for themselves and we have not taken them into account.

ten years, but the general course of steel prices may serve as an index of the way things were moving. A composite price of finished steel products including bars, beams, tank plates, wire, rails, pipes and black sheets is published annually by the Iron Age, and we have calculated what the reduced cost of the American purchases would have been if made at the present level of prices, instead of at the higher rates which actually prevailed. The underlying assumption, of course, is that the prices of machinery varied in about the same proportion as general steel prices. On this basis the present price of the new plant would be approximately 15,570,000 dollars which is less by 5,730,000 dollars than the price actually paid. This is equivalent to a saving of Rs. 184 lakhs at the average rate of remittance.

Transit charges on the new plant purchased in America.

75. The balance of the cost of the Greater Extensions—apart from minor purchases in Europe—consists of transit charges (freight, insurance etc.), and expenditure incurred in India on erection. The transit charges would be enormously lower to-day, but there seems to be no reason for thinking that the cost incurred in India would be less, for wages are not lower and coal is much higher. The Company have furnished us with full details of the cost (erected at Jamshedpur) of parts of the plant the aggregate cost of which, f. o. b. at an American port, was Rs. 264 lakhs. The total transit charges were Rs. 50 lakhs and, as the plant was shipped in several different years, the figures give a fair idea of the average transit charges. The transit charges on the whole plant would then amount to about Rs. 130 lakhs and, making every allowance for the heavy fall in freights, we cannot put the excess payments over present-day rates higher than Rs. 70 lakhs.

Low cost of the old plant.

76. The excess payments in America (Rs. 184 lakhs) and the higher transit charges (Rs. 70 lakhs) justify a reduction in the capital expenditure of Rs 2½ crores. Against this, however, must be set off the fact (already alluded to in paragraph 64) that the old plant could not be replaced to-day at its original cost. We estimated that the difference between the original cost and the present cost of a plant with the same output would be about Rs. 200 lakhs. But a plant of this size is too small for economical production under present-day conditions, and the difference in the case of a plant with treble the capacity would not be so great. The cost at present-day prices of a plant producing annually 130,000 tons of finished steel may be put at Rs. 6 crores, but the cost of a plant with a capacity of 400,000 tons would not be more than Rs. 15 crores. The replacement value of the old plant at Jamshedpur is therefore Rs. 6 crores if

it is considered as a separate unit, but only Rs. 5 crores if it is treated as a part of a larger organisation. It is sufficient therefore to allow Rs. 1 crore on account of the low cost of the old plant. The net reduction in the cost of the works as a whole is then Rs. 1½ crores which brings down the final figure from Rs. 16½ crores to Rs. 15 crores.

77. The net result of these calculations can best be exhibited in tabular form :—

Final calculation of the cost of the Jamshedpur works at present prices.

	Rs. Lakhs.
Original cost of old block	400
Collieries	200
Greater Extensions	1,500
Total	2,100
Add.—Allowance for increased cost of replacing the old block at present prices	100
Grand Total	2,200
Deduct—	
(1) Capital expenditure on the collieries	200
(2) Expenditure from the depreciation fund	250
(3) Excess expenditure on American purchases and freight, etc.	250
Final Total	1,500

In effect what has been done is to write up the old plant from Rs. 4 crores to Rs. 5 crores on the ground of the rise in prices since before the war, and to write down the Greater Extensions from Rs. 15 crores to Rs. 10 crores. Half the reduction is due to the high prices at which the new plant was purchased, and half to the fact that part of the expenditure on the new plant goes to replace the old. To a large extent indeed the old plant is already replaced. The rolling capacity of the new mills is in excess of the capacity of the steel furnaces to produce ingots, and it is far from improbable that, when the new mills have been tuned up, the old mills may be closed down. It may be added that, if the duplex process justifies the expectations formed of it, the addition of a third tilting furnace at a comparatively small cost would almost render it possible to dispense with the open hearth furnaces. The old blast furnaces are still efficient and have many years of life before them.

The Manufacturer's Profit.

78. The capital expenditure required for the construction of iron and steel works with an outturn of over 600,000 tons of pig iron and over 400,000

The Manufacturer's profit.

tons of finished steel has been found to be Rs. 15 crores. On this basis the return on the capital investment can be ascertained. The Company's share and debenture capital amounts to Rs. 16½ crores divided as follows :—

	Amount.	Rate of interest.	Interest payable.
	Rs. Lakhs.	Per cent.	Rs. Lakhs.
First preference shares	75·00	6	4·50
Second preference shares	700·00	7½	52·50
Ordinary and deferred shares	277·12	10	27·71
Debentures	600·00	8	48·00
Total	16,52·12	8·03	132·71

It will be seen that the entire capital has been raised at an average rate of 8 per cent. Interest on Rs. 15 crores at the same rate comes to Rs. 120 lakhs and it is this sum which has to be found from the sale of iron and steel.

Probable profits on the pig iron.

79. When the full production of steel is attained the surplus pig iron will be about 40,000 tons. This amount does not exceed the normal surplus which any steel manufacturer with an output of 400,000 tons of steel and making his own pig iron would provide for. Some reserve capacity for pig iron is necessary, since otherwise there is a risk that the steel furnaces might be put out of action for want of the necessary raw material, and within the limits of this surplus the profits on the pig iron may fairly be taken in reduction of the profits expected from the steel. The year 1921-22, however, was altogether abnormal, both in respect of the quantity of surplus pig iron (107,000 tons against 126,000 tons of finished steel) and the average price obtained (Rs. 94 a ton) which left a profit of nearly Rs. 50 a ton. Three companies are now competing in the Indian and export markets for pig iron and the price, especially in the export market, has fallen heavily. It would not be safe to estimate the average profit per ton at more than Rs. 20 in the future, and on 40,000 tons this means a total profit of Rs. 8 lakhs. This reduces the return which the sale of steel has to provide from Rs. 120 lakhs to Rs. 112 lakhs, and with an output of 420,000 tons the incidence is Rs. 26·67 per ton.

Overhead Charges.

80. We turn now to the overhead charges on the full production, and the first item is interest on working capital. The Company have estimated the sum required at Rs. 500 lakhs. Excluding the provision for the collieries the total comes to Rs. 445 lakhs divided as follows :—

The overhead charges—Interest on working capital.

	Rs. Lakhs.
Stores and spare parts of all kinds	180
Raw materials and refractory bricks	75
Outstanding and stocks of finished products . . .	190
Total .	445

No reduction is necessary under the second head, but both the others are, we think, over-estimated. The total expenditure in 1922-23 on stores and spare parts of all kinds was in the neighbourhood of Rs. 50 lakhs, and is not likely to exceed Rs. 120 lakhs when the new plant is in operation. Making every allowance for the fact that the Indian manufacturer has to keep a much larger stock of spare parts and other stores than the European or American manufacturer owing to the difficulty of obtaining supplies at short notice, we cannot see why the stock should be equal to eighteen months' consumption. We have checked the various items and we think Rs. 110 lakhs should suffice. The over-estimate under the third head arises from the fact that the stocks of finished goods have been valued at their selling price instead of on the basis of the out-of-pocket expenditure actually incurred. The reduction to be made here is Rs. 25 lakhs. The working capital required then stands at Rs. 350 lakhs, and interest at 7½ per cent. amounts to Rs. 26·25 lakhs. The provision for raw materials, outstandings and stocks of finished goods is equivalent to about six months' production.

81. The other overhead charges do not require a lengthy discussion.

Other overhead charges.

(1) *Bombay expenses and Agents' commission.*—The Company estimate the head office expenses at Rs. 4 lakhs, which is a reasonable figure. The Agents' commission under the terms of their contract, on the assumption that the full dividends are earned, is Rs. 8·4 lakhs.

(2) *Depreciation.*—The allowance for depreciation may be taken at an all-round rate of 6¼ per cent. on Rs. 15 crores, and the amount required is Rs. 93·75 lakhs.

Final estimate of overhead charges.

82. The surplus pig iron cannot be debited with more than about 2½ per cent. of the overhead charges and the rest has to be earned by the steel. The figures we have arrived at compare as follows with those of 1921-22 :—

	Incidence per ton of finished steel.	
	1921-22.	After full production is attained.
	Rs.	Rs.
Interest on working capital	9·59	6·09
Bombay expenses and Agents' commission	4·67	2·89
Depreciation	23·97	21·72
Total overhead	38·24	30·70
Return on capital investment	20·96	26·67
Total	59·20	57·37

The overhead charges should be distinctly lower when the new plant is in full swing, but a larger sum per ton is required as interest on fixed capital. The latter result was to be expected, as the new plant is more elaborate in type and consequently its original cost is higher.

Works Costs.

Rise in the price of coal since 1921-22.

83. The average works cost of finished steel in 1921-22 was Rs. 120·41 per ton, but two years have elapsed since then, and there may be reasons for reconsidering that figure. In one respect only the conditions have materially changed, *viz.*, the rise in the price of coal. The Company purchases coal under long term contracts by which the price is fixed at the price paid by the Railway Board for similar coal or at a figure eight annas higher. The Railway Board itself, however, entered into contracts covering a period of three years from 1st April 1922 to 31st March 1925 at prices considerably higher than those paid previously, and increasing by 12 annas a ton in each of the second and third years. We shall refer again to the Company's coal contracts in a later paragraph (see paragraph 103 below), and the only point we desire to make here is that under their operation the increase in the cost of coal was unavoidable.

Works costs in 1922-23.

84. In 1922-23 the price of purchased coal 'free on rail-collieries' rose from Rs. 6·6 to Rs. 8·96 per ton. According to the Company's cost accounts the average cost of finished steel in that year is Rs. 128·84 a ton, but in fact this figure should be higher. Had the coal been charged in the cost accounts at the purchase price *plus* freight as in previous years, the average cost of finished steel would have been approximately Rs. 135 per ton. But, owing to a change of system, coal is now charged at the average of the price paid for purchased coal and the raising cost of coal from the Company's own collieries, *plus* freight to Jamshedpur in both cases. This new system is not consistent with the principle we have adopted that the collieries should be treated as financially independent, and for our purposes the steel cost must be taken at Rs. 135. On the other hand, it was stated in evidence on behalf of the Company that, except in the price of coal, there was no important change in 1922-23, and the higher price only accounts for a rise of about Rs. 9·5 over the costs of 1921-22. The average cost may therefore be put at Rs. 130, and the balance of Rs. 5 is attributable to the strike.

Works costs in 1923-24.

85. In 1923-24 there has been an automatic increase of 12 annas a ton in the price of purchased coal and a similar increase will take place in 1924-25. Each increase is equivalent to a rise of Rs. 3 a ton in the cost of finished steel at the present rate of consumption and, though there may be compensating savings in other directions, there is no prospect that, in the old plant at least, the cost can be brought appreciably below Rs. 130 a ton until 1925-26.

Future works costs.

86. The determination of the works cost of steel during the next three or four years must be largely a matter for conjecture. The three causes which have tended to keep the cost of steel production high at Jamshedpur are—

(1) The price of coal,

(2) The comparatively low output of the steel furnaces, and

(3) The fact that parts of the plant are becoming obsolete and are expensive to operate. This applies specially to the rolling mills.

In respect of coal no relief is possible until April 1925 for (as explained in paragraph 83 above) the price is governed by the price paid by the Railway Board, which is itself fixed by a three years contract commencing in April 1922. A great improvement in the output of steel ingots is expected from the new duplex process the introduction of which is now imminent, but the process has never

yet been worked in India and the best results cannot be attained at once. The new mills are far more efficient than the old and the costs will be lower, but here again a high output is indispensable to economy, and the output of the mills depends absolutely on the production of ingots by the steel furnaces. We do not doubt that costs will steadily diminish, but it is far more difficult to forecast the rate at which they will fall.

The Company's estimate of future costs.

87. At our request the company supplied an estimate of what they considered their works costs were likely to be after full production had been attained, the price of coal being taken at the same figure as in 1921-22. The estimate compares as follows with the works cost of that year :—

	Cost per ton.	
	Actuals 1921-22.	As estimated after full production.
Pig Iron	34·47	30·95
Steel ingots	68·82	58·50
Rails	116·00	95·54
Bars	135·50	112·05
Average for products of new rail and bar mills	...	96·30
Ditto of old mills	120·41	106·50
Ditto of old and new mills	...	99·00
Sheets—galvanised and black, plates and sheet-bars	...	124·94
Average for all finished steel including sheets, plates and sheet-bars	...	106·46

An examination of the details of the estimate shows that nearly three-fifths of the reduction in the cost of rails, which may be taken as a typical product, is expected from the steel furnaces and about two-fifths from the new mill.* Some economies are also anticipated in the working of the old steel furnaces, but in the main the company look for the savings almost entirely to the new plant. On this showing, everything depends on the success of the duplex process, for the new mills will not be cheap to work unless the supply of steel ingots is fully maintained.

Future cost of coal.

88. The evidence we have received does not justify an assumption that the price of coal will in fact fall to the 1921-22 level during the course of the next three or four years. Mr. Whitworth, the Chief Mining Engineer with the Railway Board, informed us that in his opinion it was

* The reduction in the cost of pig iron does not affect costs in the later stages so much as might have been expected. The Company apparently expect that the wastage of pig iron will be higher in the duplex process than in the open hearth furnaces, and that they may be unable to utilize all the scrap produced.

doubtful whether good Jharia coal would ever be sold to Railways again in large quantities under Rs. 9 per ton. There are, however, causes at work which must eventually bring prices down. Railway facilities are being improved, the deeper mines are equipping themselves with electrical coal-cutting machinery and new coal fields are about to be opened out where at the outset the raising costs are likely to be low. We do not think it is an extravagant supposition that in three or four years the average price of the coal required by the Tata Iron and Steel Company might drop to some figure between Rs. 8 and Rs. 9 per ton, which would mean about Rs. 10 per ton at the Jamshedpur works. As the cost of coal at the works was Rs. 8 per ton in 1921-22, an increase of Rs. 2 per ton would raise the works cost of steel by Rs. 8 per ton on the basis of 4 tons of coal to one ton of finished steel.

Utilization of the surplus gases.

89. The Company have furnished us with copies of their flowsheets showing the probable distribution of the fuel to the various sections of the plant when full production is attained. The consumption of coal expected is about 4 tons per ton of finished steel, and the estimate* referred to in paragraph 87 also seems to presuppose a similar rate of consumption. It seems to us doubtful, however, whether so large a quantity will actually be required. The inflammable waste gases produced in the coke ovens and the blast furnaces are a valuable fuel, and the experience of other countries shows that, if they are fully and efficiently utilised, the coal consumption can be heavily cut down. The quantities of gas which will be burnt according to the flowsheets appear to be reasonable, but we can find no equivalent saving in coal. The United Steel Corporation of Asia have given us figures for their coal requirements and the rate is equivalent to less than 3 tons of coal per ton of finished steel. We believe that the Tata Iron and Steel Company should be able to save at least half a ton of coal per ton of finished steel as compared with their estimate, and this saving would go far to counteract the higher price of coal. The economy effected is not merely the purchase price of half a ton of coal; there are savings in labour charges also, for the gas which replaces the coal can be burnt much more cheaply.

Necessity of fuel economy.

90. This question of fuel economy is of first class importance. We made no allusion to the subject when dealing with the costs of 1921-22, for the old plant was designed at a time when coal could be landed at Jamshedpur at Rs. 3 a ton or less, and there was no particular

* The estimate for the blast furnaces shows a credit for surplus gas of 12 annas per ton of pig iron, and the coke ovens estimate a credit of a little over 4 annas per ton of coke. If the gas is valued at its coal equivalent—which seems the natural method—the figures mean that the surplus gases displace only 80,000 tons of coal, a quite inadequate figure.

incentive to reduce consumption. But the cost of coal seems to have risen permanently to a much higher level, and it is imperative that the fuel value of the surplus gases should not be wasted. It is certain that, if new steel works are erected by another firm, every possible step will be taken to keep the coal consumption low and, if the Tata Iron and Steel Company is to hold its own, economy in fuel is indispensable.

Gradual decline probable in production costs as output increases.

91. We believe that the works cost of steel at Jamshedpur can be reduced to the extent indicated in the Company's estimate, but this cannot be done at once and a transition period of several years is inevitable during which the works costs should gradually fall from about Rs. 130 to some figure in the neighbourhood of Rs. 100 a ton. There are too many doubtful factors involved to justify any confident prediction as to the rate at which costs will fall, but one point we regard as certain. The full production of 420,000 tons can be attained only gradually. The Tata Iron and Steel Company has always tended, we think, to be unduly sanguine as to the time within which results can be expected. In order to get some definite basis on which to work, we estimate that the production of finished steel may be 250,000 tons in 1924-25, 335,000 tons in 1925-26 and about 400,000 tons in 1926-27. It is not safe to assume that a process untried in India before (*i.e.*, the duplex process) will give the full results expected of it until after one or two years' practical working. If the actual output approximates to the figures given above, it will not be until the fourth year that prices will approach their final level.

The fair Selling Price of Steel.

The selling price of steel.

92. We have estimated (paragraph 82 above) that, on the full production, about Rs. 57* a ton will be required in order to meet the overhead charges on steel and the manufacturer's profit. The third element in the selling price (*i.e.*, the works costs) cannot, we have found, be put at a definite figure, but may be expected to drop gradually from near Rs. 130 to near Rs. 100. It is on this basis that we have to determine the selling price which yields a fair return on the capital investment. To this branch of the subject we now turn.

	Rs. per ton.
*Overhead	30·70
Manufacturer's profit	26·67
Total	57·37

Basic selling price of steel not higher than Rs. 180 a ton.

93. We have found (paragraph 68 above) that in the year 1921-22 an average selling price of Rs. 180 a ton would have given the Indian manufacturer a fair return on his capital. Save in so far as there have been material changes tending to raise the cost of manufacture since that year, the figure of Rs. 180 a ton is the natural limit of any scheme of protection which might be put forward, and the only important change which has occurred is the increase in the price of coal which has raised costs by about Rs. 10 a ton. On the other hand, the rise in coal prices will not operate to its full extent after the year 1924-25, and the Indian manufacturer can protect himself against any increase in price which may prove permanent both by the development of his own collieries and by better utilization of his waste gases. Again, the stores used in 1921-22 must to a large extent have been purchased during a period of high prices and expenditure on this account should tend to be lower. Finally, from 1924-25 onwards steel will be produced in a plant much more economical to operate than the old plant. For these reasons we do not find sufficient grounds for taking a higher figure than Rs. 180 a ton.

A selling price lower than Rs. 180 a ton inadequate as a basis of protection.

94. We have considered whether it would be possible to base our recommendations on a somewhat lower selling price, but we find this to be impossible if the measures proposed are to be adequate for their purpose. We have found that the Indian manufacturer requires in addition to his works expenditure a sum of Rs. 59·20 per ton on the basis of the production of 1921-22, and a sum of Rs. 57·37 a ton on the basis of the full production, in order to secure a fair return on the capital invested. But it is certain that full production will not be attained in 1924-25 and very unlikely, in our opinion, that it will be reached in 1925-26. On a production of 250,000 tons of finished steel, which is all that it is safe to rely on in 1924-25, the overhead charges alone would approach Rs. 50 a ton and an average selling price of Rs. 180 a ton would leave little or no margin for the return on capital. In 1925-26 production might rise to about 335,000 tons and the incidence per ton of the overhead charges would then drop to Rs. 39. As the works expenditure would also be lower, there would be a margin of profit. The full production will not, we think, be approached until 1926-27, and not till then would the manufacturer obtain what may fairly be considered a normal profit. We have not overlooked the fact that, so long as the production of steel is less than the full capacity of the plant, there will be a large surplus of pig iron, and that the profits on its sale will go some way to provide a return on capital.

But it would be a mistake to suppose that the profits on pig iron are likely to approach the figures of 1921-22, and the larger the surplus to be disposed of, the lower must be the average profit per ton which can be realized. The Indian production would far exceed the absorptive capacity both of the Indian market and of the foreign markets where Indian pig iron has already found a sale, and in order to secure an entry into new foreign markets it would be necessary to accept a price which left only a small margin of profit. If allowance be made for the production of the Bengal Iron Company and the Indian Iron and Steel Company*, it is doubtful whether the Tata Iron and Steel Company could sell 100,000 tons of surplus pig iron at an average profit of Rs. 20 a ton, and for any excess over that quantity the average profit would be much lower. As the Company require Rs. 120 lakhs annually for interest on debentures and dividends, it is obvious that the profits on the surplus pig iron would not go far to provide the sum required.

Practical results of a selling price of Rs. 180 a ton.

95. The problem can also be viewed from another angle. The total sum which the manufacturer requires in order to meet his overhead charges on the full production is about Rs. 129 lakhs, and as a return on the capital invested Rs. 112 lakhs. A selling price of Rs. 180 a ton will suffice to produce these sums, provided the works costs do not exceed Rs. 123 a ton, and provided the full outturn is attained. But so long as the output of steel is below 420,000 tons a year, a selling price of Rs. 180 a ton gives the manufacturer a good deal less. In effect, therefore, he receives what we believe to be the fair allowance per ton for overhead charges and capital on the steel he actually produces, but not on the excess tonnage he will be able to produce in the future. In other words, no allowance is made for the heavier incidence of the overhead charges and profit per ton during the period when production is comparatively low. The manufacturer has, therefore, every incentive to bring his works costs as low as possible and to increase his output, since by these methods alone can profits be obtained. This aspect of the case is, we think, important.

We have not overlooked the fact that part of the fixed capital expenditure has been financed by the issue of debentures, and that interest on these debentures is a primary charge on the Company's resources. The production in 1924-25 we have taken as 250,000 tons of finished steel and, even if the works costs amount to Rs. 130 per ton, a selling price of Rs. 180 per ton means a surplus of Rs. 125 lakhs. To this sum at least Rs. 20 lakhs must be added on account of the surplus pig iron. The debenture interest (Rs. 48

* The two blast furnaces of this Company, both completed since March 1922, have a capacity of 280,000 tons of pig iron a year.

lakhs) and the interest on working capital (Rs. 26·25 lakhs) are therefore amply covered.

The selling price of Rs. 180 a ton adopted as the basis of proposals made.

96. The final result of the enquiries which we have summarised in Chapter V and in this Chapter is that our recommendations should be so framed as to secure to the Indian manufacturer an average selling price of Rs. 180 a ton. We have been conscious throughout that this part of our task was exceedingly difficult, and we have spared no pains to investigate the facts. The time occupied might perhaps have been shorter if the case for the steel industry had been presented by the Tata Iron and Steel Company in a more complete form at the outset, but we desire to acknowledge cordially the readiness with which the Company complied with all our requests for information. Whatever the particular subject under enquiry might be, the Company gave us every opportunity to investigate the facts for ourselves, and allowed us to inspect all documents which we desired to see. We had hoped also to enlist the assistance of the business community generally in examining the cost of production and kindred questions, and it was with that object that we published in October the evidence taken at Jamshedpur in August. Our hopes were disappointed, however, and we received no criticisms of this part of the case. The witnesses from whom we endeavoured to obtain opinions in oral examination explained that they could not deal with the matter without a closer scrutiny of the published evidence than either they, or the bodies they represented, had attempted. We mention the fact in no spirit of complaint, but in justice to ourselves we desire to make it plain that we should have welcomed assistance from commercial men in the investigation of a very difficult question.

CHAPTER VII.

General considerations affecting the Board's proposals.

37. The conclusions at which we have arrived up to this stage may be stated as follows :—

Summary of the conclusions.

(1) India possesses great natural advantages for the manufacture of steel owing to the richness and abundance of the iron ore deposits and the comparatively short distance which separates them from the coal fields.

(2) At the present time the continued existence of steel manufacture in India is in grave jeopardy and, unless protection is given, there is no prospect of further development for many years to come.

(3) The natural advantages are so great that eventually steel manufacture in India should be possible at as low a cost as in any other country.

(4) In the national interests it is of great importance that steel should be manufactured in India.

(5) The prices at which steel of the kinds we are concerned with is likely to be imported to India without duty are :—

	Per ton. Rs.
Bars	140
Structural shapes, *i.e.*, angles, beams, channels, etc.	145
Rails, 30 lbs. and over	140
Plates, ordinary	150
Sheets, black	200
Sheets, galvanised	300

(6) The average price which gives the Indian manufacturer a fair return on his capital is Rs. 180 a ton.

It is on these data that our recommendations are based, but before stating them we desire in this chapter to explain our attitude on certain general questions which necessarily affect our proposals. These are the principle of discriminating protection, the extent to which protection should be given by means of bounties or subsidies, the advantages and disadvantages of specific and *ad valorem* duties, the period which our recommendations cover, and finally the special circumstances affecting the Tata Iron and Steel Company and the extent to which they should be taken into account in the protective scheme.

Discriminating protection.

98. We referred very briefly in Chapter III to the policy of discriminating protection and to one of its coroliaries, but the point requires some slight amplification. The phrase was defined by the Fiscal Commission in the sense that the temporary sacrifice, which even the most successful protection must entail, should be restricted to the minimum necessary to attain the object aimed at This principle as we understand it operates in three ways :—

(1) It governs the selection of the industries to be protected,

(2) It limits the amount of the protection to be granted, and

(3) Within each industry it excludes from the protective scheme those products which are not made and are not likely to be made in India.

All these aspects are important, but it is the third which chiefly concerns us here. Throughout our enquiry we have had the question before us, and we have endeavoured to frame our proposals so as to avoid interfering with products which will continue to be imported because there is no one in India to make them. This excludes from the scope of our recommendations most classes of machinery and, with one or two exceptions, everything classed as hardware. Within the iron and steel schedule it rules out several items of which the most important are tram rails, hoops and strips and all pipes and tubes except those built up and rivetted from steel plates. Finally, within each group of articles it renders it necessary to leave untouched, as far as possible, those qualities of steel (*e.g.*, high tensile and special alloy steel) which no firm in India has yet made, nor is likely to make for a number of years. Minute discrimination is not always possible, but to the best of our ability we have formulated our proposals in accordance with the principle laid down.

Protection by means of bounties or subsidies.

99. The steel industry is a basic industry and, if its price be raised by the imposition of protective duties, the effect on other industries must be far reaching. For this reason the Fiscal Commission pointed out that the best means of assisting a basic industry may often be found by means of a bounty rather than by a protective duty. We fully recognize that the protection of basic industries by means of bounties has certain obvious advantages, but we fear that for financial reasons any scheme which proposed to accord protection to steel solely by this means must be dismissed as impracticable at present, and we need not dwell on the point further. We have, however, considered whether a scheme could be devised of a combination of tariff duties and bounties so as to restrict as far as possible the burden on the consumer. To a limited extent we have

had recourse to this expedient, but for practical reasons it is impossible to give full effect to it. During the next years the production of steel at Jamshedpur will increase from 126,000 to 420,000 tons, and this must entail a very serious reduction in the revenue at present derived from customs duties on steel. Any scheme of balancing duties against bounties is in danger of breaking down because the extra revenue from which the bounties are to be paid is a vanishing quantity which ultimately disappears altogether. We do not consider it possible to go further in this direction than we propose to go (see paragraph 116 below).

Specific and *ad valorem* duties.

100. We do not propose to discuss at any length the relative merits of specific and *ad valorem* duties. The experience of other countries seems to show that, with the gradual development of the protective scheme, the specific duty plays a larger and larger part in the tariff. When the object in view is the raising of revenue, it is natural to assess the contribution levied on imports according to the value of the goods. But when protection and not revenue is the goal, *ad valorem* duties have a serious defect, especially when prices are subject to wide fluctuations. When prices are high and protection is least needed the customs duties are highest, while when prices are low and the need for protection is greatest, the duties are also low. For this reason we have proposed specific duties wherever possible. It may be necessary, however, for special reasons, to make an exception in the case of fabricated steel.

Limitation of the Board's proposals to a period of three years.

101. We have based our proposals on an average selling price of Rs. 180 a ton for raw steel. It is impossible, however, on that basis to make recommendations intended to remain in force over a long period, for we believe that in three or four years time it will be possible to reduce the cost of steel production in India to a level at which the manufacturer will be able to sell steel at a price much below Rs. 180 a ton and still make a reasonable profit. We recognise that there are grave disadvantages in a scheme of protection limited in this way. We have had it in evidence that if a new firm were to undertake the manufacture of steel, a period of five years would probably elapse before steel was actually produced. One of the objects protection is intended to secure is to produce internal competition behind the tariff wall, and if the protective duties are subject to frequent revision, the prospect of the establishment of new steel works is diminished. In spite of this obvious objection, however, we are compelled to limit our recommendations to a period of three years. We have to deal with conditions as they are and not as we should

like them to be. All our proposals imply some estimate of future world prices for steel and of future manufacturing costs. These estimates are made at a time when prices are subject to wide fluctuations under influences both political and economic, and when the cost of steel making in India will depend on the result of using a process of manufacture which has not yet been tried in the country. In these circumstances long views are impossible, and we believe it will be necessary to hold a fresh enquiry in 1926-27, when the new plant at Jamshedpur has been working for two complete years. By that time world conditions may be more stable and the general level of prices may have settled down. It will then be possible to deal with production costs in the new plant on the basis of ascertained facts instead of the estimates and conjectures which have had to serve our purpose. Meanwhile, even though the rate of protection cannot be assured for more than a short period, it is at any rate possible to lay down the policy definitely, and it is for this reason that we laid stress on the point in Chapter III.

Difficulties created by the fact that rolled steel is manufactured by only one firm in India.

102. We turn now to the special circumstances affecting the Tata Iron and Steel Company. Throughout our enquiry we have been conscious of the difficulty created by the fact that there is only one firm in India manufacturing rolled steel. Inevitably we have had to concentrate our attention on the affairs of one company, but we have not been insensible to the necessity of a wider outlook. Our estimate of the capital expenditure on which the sale of iron and steel must provide a fair return, if the industry is to flourish, and on which the allowance for depreciation must be calculated, is not the actual expenditure of the Tata Iron and Steel Company, but the expenditure which, to the best of our judgment on the data available, any manufacturer of iron and steel on the same scale would have to incur. Similarly our estimate of the working capital required is essentially a calculation of the extent to which a manufacturer of iron and steel under Indian conditions must incur expenditure in anticipation of receiving the price of his finished goods. In respect of the works costs the only Indian data available are the actual costs at Jamshedpur and there can be no other for at least five years to come. It was necessary for the purposes of our enquiry that we should consider whether costs had been raised to an unjustifiable level by failures on the part of the technical management, but no facts have been brought to our notice which would justify us in making a criticism of that kind. The Jamshedpur plant compares unfavourably with many plants in western countries in two respects—(*a*) the comparatively low outturn of the steel furnaces, and (*b*) the imperfect

utilization of the surplus gases. But we are not entitled to say, and we do not say, that a larger output of steel ingots could have been obtained in the last four years without sacrifice of the quality which it was all important to secure. As for the excess consumption of coal, the point was of little importance when the works were first established owing to the low cost of coal, and even at the time when the extensions were projected (1916-17) coal was landed at the works at Rs. 3-8 a ton. The question of fuel economy has now become vital, but we have laid stress on it rather because of its importance in the future than its bearing on the past.

The coal contracts.

103. The most important criticisms of the Company which have come to our notice relate not to the technical management at Jamshedpur, but to the general administration of its affairs for which the Bombay office is responsible. Exception has, for example, been taken to the twenty-five year contracts for the purchase of coal which the Company has made (see also paragraph 83 above). These contracts provide that the price shall be the same as, or higher by eight annas a ton than, the price paid by the Railway Board. The result is that in the current year, and almost certainly in 1924-25, the Company are paying more than the market price for the coal they buy. It does not follow, however, that the contracts were ill-judged. There may be room for doubt whether it was necessary or expedient to make contracts for so long a period as 25 years or for so large a quantity as three-quarters of a million tons of coal. But since the Railway Board is by far the largest purchaser of coal in the market, any firm which can secure supplies at or about the price which the Board is paying should have a reasonable assurance that the price will be below and not above the ordinary level. These expectations have been falsified recently owing to causes which could not be foreseen, but when the three-year contracts made by the Board expire, the Company will no doubt again secure its coal at a reasonable price.

The rail contracts.

104. The contracts made with the Railway Board and with certain Railway Companies stand on a different footing. The earliest is the contract with the Bengal Nagpur Railway Company which was negotiated in 1915. Next in order are the contracts with what are known as the Palmer* Railway Companies which were made in 1918, while the contract with the Railway Board, which is latest in date, was made in 1919. All the contracts took effect

* The Bombay, Baroda and Central India Railway, the Madras and Southern Mahratta Railway, the Nizam's Guaranteed State Railway, the Bengal and North-Western Railway, the Burma Railways and the Assam Railways and Trading Company.

from 1st April 1920, and their duration and the prices fixed are shown in the following statement :—

Name of Railway Administration.	Duration of contract.	Prices fixed per ton.	Rs.
Bengal Nagpur Railway.	5 years till 31st March 1925.	Rails . .	110
		Fishplates . .	140
Palmer Railways .	6 years till 31st March 1926.	Rails . .	122·8
		Fishplates . .	152·8
Railway Board .	7 years till 31st March 1927.	Rails . .	130
		Fishplates . .	160

The prices actually received from the Railway Board were never so low as those fixed by the contract. By special arrangement the Company received, up to the 30th September 1921, a certain percentage of the difference between the contract price and the market price in England, and from the 1st October 1921 onwards, by arrangements renewed from time to time, the price has been fixed at Rs. 156 a ton. The Company has furnished us with a statement explaining fully the reasons why they considered it desirable to make certain of the sale of their staple product for a period of years after the war and how the prices were fixed. We do not propose to discuss these explanations at length. Events have proved that the Company was wrong in its judgment both as to the price likely to be obtained for rails in the open market and the cost at which it could manufacture. Similar errors in judgment were frequent both during and after the war, and ordinarily bargains which prove unprofitable furnish no ground for State assistance to the party who has suffered. But in this case Government is itself the proprietor of nearly all the Railways with which the contracts were made, and in so far as the contracts have entailed loss to the Company, they have at any rate secured a very substantial gain to the tax-payer.* We do not think this fact can be ignored, once it is decided that the steel industry should be protected.

Financial difficulties of the Tata Iron and Steel Company.

105. During the last three years the Tata Iron and Steel Company has had to face very serious difficulties. The time occupied in the construction of the Greater Extensions has exceeded the original estimate by three or four years and the cost

* The Tata Iron and Steel Company estimate that the total saving to the Railways from these contracts in the two years 1920-21 and 1921-22 was Rs. 142 lakhs. This estimate assumes that, but for the contracts, the Railways would have had to pay for imported rails and fishplates the prices quoted in the trade papers. In fact, however, rails can always be purchased for export in large quantities at prices substantially below the trade paper quotations. If a deduction of Rs. 20 per ton be made from the quoted prices on this account, and if 90 per cent. of the savings on the Company-worked lines is taken as the Government share, the net saving to the tax-payer for the two years is Rs. 108 lakhs. Further savings have also accrued in the last two years, but owing to the low price of imported rails these are much smaller.

of the scheme has also proved much higher than was at first expected. One result has been that the Company had to face the great fall in prices in 1921 without being able to utilize the new and more economical plant which was being installed. Another consequence is that the share capital originally raised to meet the cost of the extensions proved inadequate, and the Company has laboured under the necessity of raising fresh capital otherwise in order to complete the new works. In these circumstances the financial resources of the Company have been severely strained. In some of the evidence we have received, these financial difficulties have been referred to as if the supposed need for protection was created solely by them, and it has been argued either that the situation could be met by a reconstruction of the Company with a reduced capital, or that if State assistance is given, it should take the form of a loan or guarantee. In view of these criticisms it is important that we should make our position clear. In our judgment, the need for protection does not arise from any question of finance, but from the difference between the price at which steel is imported and the price at which the Indian manufacturer can sell. The main reason for the wide difference between these two prices is the present high cost of production in India. This is undoubtedly due in part to the delay in bringing the new plant into operation, but it is not due at all to the difficulty in raising capital. It is for this reason that we do not propose to examine the validity of the criticisms frequently made regarding the high dividends paid by the Company in certain years. It is obvious of course that, if dividends had been restricted, the Company's financial position would have been easier, and less outside capital would have been required. But the need for protection would have been exactly what it is to-day. The extra loans which the Company has had to raise do not enter at all into the cost of production as we have determined it.

Extent to which special circumstances affecting the Tata Iron and Steel Company have affected our proposals.

106. It is desirable that we should indicate to what extent, in our opinion, the special circumstances affecting the Tata Iron and Steel Company may justifiably be taken into account in the proposals we are about to make. In the first place, we think that account must be taken of the present high level of costs and the fact that the economical production which the new plant ought to give will be attained only gradually. In so far as the present high costs are due to the price of coal, allowance should be made because any manufacturer of iron and steel was likely to be affected in the same way. The Indian Iron and Steel Company has made precisely similar contracts for the supply of the coking coal required for its blast

furnaces, and Mr. Tarlton (of Messrs. Bird and Company) giving evidence for the United Steel Corporation of Asia expressed the opinion that on the average a contract of this kind was likely to result in favourable prices. In so far, again, as higher costs during the transition period are due to difficulties in working an unfamiliar process of steel manufacture, the same difficulties would affect any firm commencing to manufacture steel in India, and even to a greater degree. Finally, since the object of protection is to preserve and develop the steel industry, the measures taken must be adequate for their purpose, and must do justice to the facts of the case. Whatever reasons may exist for withholding protection altogether, there are none for any scheme which at once raises prices to the consumer and at the same time fails to preserve the industry. The general principle which underlies our recommendations, therefore, is that the assistance granted should suffice to give the Company—

(*a*) when they reach their full production a fair return on their capital outlay after meeting all overhead charges, provided the works expenditure is reduced to a reasonable figure, and

(*b*) the minimum of assistance required to tide the industry over a difficult period.

It is in the light of these considerations that we have taken Rs. 180 a ton as the basic selling price for the manufacturer.

Special treatment required for rails.

107. In the second place, we think that the form of our proposals may rightly be affected by the special position as regards rails. So long as the Company is bound under contract to supply rails at a certain price, the imposition of a tariff duty must be largely nugatory. The object of protective duties is to secure a fair price to the producer, and it is quite useless to raise prices to the consumer if the manufacturer is no better off than before. It has already been pointed out, moreover, that the tax-payer, as the ultimate proprietor of the Railways, benefits directly from the contracts, and if the Legislature, representing the tax-payer, decides that it is expedient in the public interest that the manufacturer should receive a higher price, it seems natural to adopt the most direct method of securing that result. The circumstances clearly point, therefore, to the advisability of dealing with rails by way of bounties rather than by way of tariff duties.

The burden on other industries and on the consumer.

108. One very serious question remains for consideration namely, the burden which protection for steel is likely to entail on other industries and on the consumer. But it is clearly more convenient to defer its discussion until we have explained our proposals, for a purely hypothetical discussion is likely to be infructuous.

CHAPTER VIII.

Recommendations regarding the protection of the steel industry.

Scope of the Board's recommendations.

109. We shall now state and explain the proposals which we recommend to the Government of India for adoption. In this Report we shall deal primarily with what may be called raw steel, *i.e.*, the products manufactured by the Tata Iron and Steel Company. Of these the principal are—

Structural shapes, *i.e.*, beams, angles, channels, etc.

Plates, ship, tank and bridge.

Bars and rods, common.

Sheets, black and galvanised, whether corrugated or plain.

Rails and fishplates.

The consequential effect of our proposals on the engineering industry and on the use of wrought iron will also be briefly discussed. But our recommendations regarding what may be called the subsidiary industries (tinplate, enamel ware, agricultural implements, etc.), must be reserved for the Second Report which we hope to submit at a very early date. In the proposals now made we have aimed at securing to the manufacturer an average price of Rs. 180 a ton, but in one or two cases we have gone slightly above or below this figure. Sheets, whether galvanised or plain, stand on a different footing and have been dealt with specially.

Structural shapes.

110. *Structural shapes (that is, beams, angles, channels, etc., unfabricated).*—The average price at which steel of this kind is likely to enter India without duty is Rs. 145 a ton and the present tariff valuation is Rs. 150 a ton for angles and Rs. 170 for channels (a figure which seems to us excessive). Other shapes are assessed *ad valorem*, the rate of duty being 10 per cent. in all cases. The present duty may be taken as Rs. 15 a ton on the average. We propose a specific duty of Rs. 30 a ton, which is equivalent approximately to a 20 per cent. duty. A somewhat higher duty of Rs. 35 a ton would be required in order to raise the selling price to Rs. 180 a ton, but we have preferred in this case

to take a slightly lower figure. It is through the price of structural steel that the engineering industries and the Railways are most likely to be affected, and we are anxious that the burden on them should be lightened as far as possible. We have taken into account also the fact that our proposals about rails (see paragraph 116 below) will, at any rate in the first year, give the manufacturer rather more than Rs. 180 a ton. Steel angles and channels are assessed in the tariff schedule separately from wrought iron, all beams are entered in the ' iron or steel ' section of the present schedule.

Plates.

111. *Plates.*—The price at which ship, tank and bridge plates are likely to enter India without duty is Rs. 150 a ton and the present tariff valuation is Rs. 150. We propose a specific duty of Rs. 30 a ton on plates of this kind. Boiler firebox and special quality plates will remain subject to the present tariff, but as their valuation is Rs. 300, all plates will in effect pay the same duty of Rs. 30 a ton. Wrought iron plates are not in common use and such as are imported are nearly all of special qualities. The cost of manufacturing plates at Jamshedpur has hitherto been a good deal above the corresponding cost of rails and bars. We have taken no account of that fact, however, for the plate mill has not hitherto been worked to anything like capacity.

Bars and rods.

112. *Bars and rods.*—The price at which ordinary steel bars and rods are likely to enter India without duty is Rs. 140 a ton, and the present tariff valuation of common bars is Rs. 135 or Rs. 150 a ton according to size. The present duty is therefore Rs. 13-8 or Rs. 15 a ton. We propose a specific duty of Rs. 40 a ton, the incidence being from 27 to 30 per cent. This proposal does not affect Swedish bar, and similar qualities, bars made of crucible or high tensile steel or bars which are galvanised, tinned, planished, polished or lead-coated. These remain subject to the existing duties, and wrought iron bars are in a separate part of the schedule. The specific duty of Rs. 40 a ton is not sufficient to enable the Indian manufacturer to sell his bars at an average price of Rs. 180 a ton in competition with Continental bars in all Indian markets. We have taken into account, however, the fact that at Jamshedpur bars are manufactured to a standard with which the Continental bar does not always comply, and that they tend rather to compete with bars manufactured in the United Kingdom, the price of which is somewhat higher. We have also made allowance for the fact that in some of the up-country markets the Indian manufacturer, owing to the favourable rates he can secure for complete wagon loads from the Railway administrations, is in a stronger position to meet competition.

Sheets—galvanised and black not yet manufactured in India.

113. *Sheets.*—The Tata Iron and Steel Company will manufacture both ordinary and black sheets and galvanised sheets. It is entirely uncertain, however, what the cost of manufacture will be, for the Company have not yet set their sheet mills in motion, and are not likely to do so until September 1924. The only evidence we have as to costs is the estimate made by the Company at our request on the basis of 1921-22 coal prices. This estimate puts the works cost of black sheets at Rs. 149 a ton and of galvanised sheets at Rs. 194 a ton. The present tariff valuation of black sheets is Rs. 175 a ton (which is, we think, a low figure), and that of galvanised sheets is Rs. 300 a ton which agrees with the figure at which we arrived. It will be seen that, if the Company can manufacture sheets at figures approaching those they have given, the existing price *plus* ten per cent. duty gives them a much larger margin above the works cost than they have in the case of other products. On the other hand, the estimate is for the eventual cost when manufacture has been going on for some time; and the actual cost during the first two or three years of manufacture will unquestionably be higher. We do not think that at the outset the manufacture of sheets can be established in India without protection of some kind. At the same time, in the absence of data as to the cost of manufacture, our proposals must be limited to the lowest amount which has any chance of attaining its object.

Black sheets—proposals.

114. The entries regarding sheets, whether galvanised or not, in the present tariff schedule are somewhat complicated. Ungalvanised sheets fall under four entries—

	Tariff Valuation per ton. Rs.	Present duty. Rs.
Sheets which have been cold rolled, smoothed (including planished) pickled or cleaned by acid or other material or process	200	20
Sheets black, plain	175	17·8
Sheets, black, corrugated up to and including 26 Gauge	300	30
Sheets black corrugated above 26 Gauge .	400	40

The valuation of the corrugated sheets must be due to some misapprehension, for the corrugation cannot possibly make a difference of anything like Rs. 125 in the value. The average value of black sheets, corrugated and plain, may be taken as Rs. 200 a ton, and we propose that these sheets should be subject to a specific duty of Rs. 30 per ton, which is equivalent to 15 per cent. Sheets falling under the first entry will remain subject to the existing duty. We have not thought it necessary to discriminate wrought iron sheets of which the imports are negligible.

115. The present classification of galvanised sheets for tariff purposes is as follows :—

Galvanised sheets—proposals.

	Tariff Valuation per ton.	Present duty.
	Rs.	Rs.
Corrugated up to and including 26 Gauge.	300	30
" " " " above 26 Gauge.	400	40
Plain up to and including 26 Gauge	320	32
" " " " above 26 Gauge	425	42·8

It is not obvious why the plain sheets should be valued more highly than the corrugated. We propose a uniform specific duty of Rs. 45 a ton for all galvanised sheets. This makes practically no difference to the very thin sheets above 26 Gauge, and amounts to about 15 per cent. on the thicker sheets which are in common use.

116. *Rails and fishplates.*—We have already explained (paragraph 107 above), why, in our opinion, rails should be treated differently from other steel products. The present duty is 10 per cent. *ad valorem* for which we think a specific duty of Rs. 14 a ton might with advantage be substituted. But the additional assistance which the Indian manufacturer requires ought, we think, to be given in the form of a bounty. This is the more desirable because the increase in Railway costs will be very greatly diminished. The price at which rails are likely to enter India without duty is Rs. 140 a ton which the addition of the duty would raise to Rs. 154. We propose that bounties should be given on the manufacture of rails (30 lbs. and over) and fishplates for the next three years in accordance with the following sliding scale—

Rails and fishplates.

	Rs.
1924-25	32 a ton.
1925-26	26 "
1926-27	20 "

Save in so far as the Indian manufacturer is bound by long-term contracts, the effect would be to give him Rs. 187 a ton for rails in the first year, Rs. 181 in the second and Rs. 175 in the third. There are two reasons why a sliding scale is desirable. In the first place, the existing contract with the Bengal Nagpur Railway will terminate in March 1925, the contracts with the "Palmer" Railways in March 1926 and the contract with the Railway Board in March 1927. In each year, therefore, the manufacturer will receive for the rails he sells a price more nearly equal to the current world price, and in the second place costs will fall as production increases. For both reasons the need for outside assistance will diminish from year to year. The bounty should, we propose, be

payable only on such rails and fishplates as are passed by the Government Metallurgical Inspector at Jamshedpur who inspects all rails manufactured for the Indian Railways. As the Inspector maintains in any case complete records of the quantities of rails passed by him, the determination of the amount payable on account of bounties from time to time presents no difficulties. Under these conditions the bounty will not be payable on light rails (under 30 lbs.) which are sold principally to private consumers. The imported price of these is variable but may be taken at Rs. 140 a ton. We propose a specific duty of Rs. 40 a ton on such rails and on fishplates therefor.

Effect of the Board's proposals on the use of wrought iron.

117. In the present tariff certain kinds of wrought iron, *viz.*—angle, channel, bar and rod—are included in a separate section apart from steel. The effect of an increase in the duties on steel may quite possibly be to increase the imports of wrought iron. For a number of purposes for which bars and angles are used, wrought iron is as suitable as steel (indeed in some cases preferable), and for many other purposes iron would be accepted as a satisfactory substitute for steel if it were a little cheaper. The manufacture of wrought iron in Europe has, we are advised, been affected by post-war conditions even more adversely than that of steel, and plant now lying idle there could quickly be brought into production and supply large additional quantities of iron to India if there were a demand for it. Before the war, wrought iron of the commoner kinds was more expensive than steel, but during the last two years the difference in price has been small and there have even been occasions when Belgian iron bars have been quoted at a slightly lower price than Belgian steel bars. In these circumstances we see no alternative, if the protection given is to be effective, but to raise the duties on certain kinds of wrought iron, even though it is not produced in India and the ordinary arguments for protection do not apply.

Wrought iron bar and rod—proposals.

118. The present tariff classification of wrought iron bar and rod is as follows :—

	Tariff valuation.	Present duty.
Bar and Rod—	Rs. per ton.	Rs.
Qualities superior to grade A of the B. E. S. A.* Grade A of the B. E. S. A. and . . .	350	35
Crown quality and intermediate qualities—		
Over ½ inch in diameter or thickness . .	160	16
½ inch and under	190	19
Common	140	14
Ditto if galvanised, tinned or lead coated .	180	18

* British Engineering Standards Association.

When wrought iron bar of the superior qualities is imported, it is nearly always because it is required for a purpose for which steel is not so suitable, and it is not desirable to raise the cost of such bar if this can possibly be avoided. It is common bar which is likely to compete with steel, and we propose that a specific duty of Rs. 35 a ton should be imposed on common iron bar and rod (not coated with other metals), the duty on the other qualities to remain as at present. The incidence of the duty will be 25 per cent. on the present valuation. The corresponding duty proposed for common steel bar is Rs. 40 a ton.

Wrought iron angle and channel—proposals.

119. The present tariff classification of wrought iron angle, tee and channel is as follows:—

	Tariff valuation.	Present duty.
	Rs.	Rs.
Angle and tee—Crown and superior qualities . .	200	20
Other kinds	160	10
Do. if galvanised tinned or lead coated .	200	20
Channel	170	17

Wrought iron angles and channels are not so likely to compete with steel as wrought iron bars. The duty proposed for steel angles and channels is Rs. 30 a ton which is likely to raise the selling price to Rs. 175 a ton, and unless the price of wrought iron angles dropped below the present tariff valuation, they would be no cheaper than steel. A comparatively small decrease in the price might, however, lead to increased imports of wrought iron. It will suffice we think if a specific duty of Rs. 20 a ton is imposed on wrought iron angles and tees, 'other kinds' (not coated with other metals) and on iron channels. The present tariff valuation of iron channel seems to us high. The superior qualities of angles and those coated with other metals would be left as at present. The effect would be that all iron angles and channels would pay the same duty of Rs. 20 a ton.

Fabricated steel and the Engineering industry.

120. Our recommendations regarding the Engineering industry will be made in our Second Report, but we cannot close this Chapter without some allusion to it. The principal raw materials of the industry are cast iron and steel, and the inevitable increase in the price of steel resulting from our proposals must raise the costs of all firms which fabricate steel. From the evidence we have received it is obvious that for the last two years foreign competition in all fabricated steel has been extremely severe, and a substantial increase in costs must be a serious blow to the industry. On that aspect of the case, however, we do not now dwell. Our

immediate object is to point out that the market for certain kinds of steel manufactured in India, *viz.*—all structural shapes, plates and to a smaller extent sheets and bars—depends on the existence of the engineering firms. No discrimination is ultimately possible between the manufacture of raw steel and its fabrication, for the two are inseparably connected and stand or fall together. It would be of little use to protect the manufacture of unfabricated steel, if the result were that the demand for it greatly diminished. We are satisfied from the evidence we have taken that, if the proposals made in this chapter are adopted, it will be necessary to raise the duty on fabricated steel to at least 20 per cent. and possibly to 25 per cent. in some cases. We defer our specific recommendations not because we are in any doubt as to their general scope, but because their elaboration and completion would have delayed our Report on the main issue.

Payment of Customs Duty by all Government Departments.

121. It was our intention to put forward another proposal of a more general kind. It was strongly urged by a number of witnesses—particularly by representatives of the engineering firms—that Customs duties should be paid by all Government departments on stores imported by them. Under the existing Store Purchase rules, the duty is to be taken into account when the prices of imported goods are compared with the prices of articles produced in India. But our attention was called to cases in which the rules had been disregarded or overlooked, and this is not unnatural, for by importing from the Stores Department in England the indenting officer may be able to relieve himself of trouble and responsibility. The announcement of the Government of India that the law will be amended so as to necessitate the actual payment of Customs duty on imported stores (with a few specified exceptions) makes it unnecessary for us to submit a recommendation. The new procedure will ensure that any extra cost involved by importation will be reflected in the accounts of the spending department, and a powerful influence will come into operation tending to secure observance of the rules. The object of protection is to secure the Indian market for the Indian producer, and the Government purchases of iron and steel constitute a large part of the effective demand. The evidence given by the engineering firms suggests that more than half their sales of fabricated steel were to Government, to Railways and to other public bodies. The point is therefore of importance in connection with the manufacture of steel, and it is for this reason that we have referred to it.

CHAPTER IX.

Objections to protection for steel and the burden on the consumer.

Scope of this Chapter.

122. In the last Chapter we stated and explained our proposals for granting protection to the steel industry, and it remains that we should examine the objections to the grant of protection for steel and the cost to the country of the measures we recommended. When we submit our Second Report we shall estimate what the total burden is likely to be and how it is likely to be apportioned as between industries and the consumer generally. In this Chapter we shall first explain the point of view from which we have approached the problem and discuss briefly the general objections which have been urged. Thereafter we shall deal with the increase in Railway costs, the tariff on machinery and the effect on one important industry of our proposals. For this purpose we have selected the jute industry because it is the only one in which some of the data necessary for an exact estimate have been placed before us.

The general question of Free Trade and Protection not before the Board.

123. One important point must be made clear at the outset. The general question of free trade *versus* protection is not in any way within the terms of our reference, and in so far as the objections to protective duties brought before us, whether in written representations or in the oral evidence, merely state the objections to all protective duties, they are beyond our scope and need not be discussed. But we are bound of course to consider the special circumstances affecting the steel industry and whether the cost of securing its development is greater than the advantages likely to be obtained. The steel industry is a basic industry in the full sense and any increase in the price of steel has far-reaching effects.

Principal objections to protection for steel.

124. The principal objections to protection for steel which have been placed before us may be briefly stated as follows :—

(1) The Indian agriculturist is very poor and a higher price for steel means that the implements of his daily work will cost him more.

(2) Protection for steel is contrary to the interests of agriculture, because it will involve a considerable reduction of imports into India and consequently of exports from India, and the foreign market for India's agricultural products will therefore be restricted.

(3) The costs of every industry in India will be raised if the price of steel goes up and the effect of a duty on steel is therefore cumulative and far-reaching. In particular it would affect profoundly both the Railways and the coal mines and would tend to keep both Railway rates and coal prices at an excessive level.

We are indebted to Mr. Pilcher of Calcutta for a very full and able discussion of the question from this point of view, and the same arguments in substance were advanced by several commercial bodies, of which we need only mention specially the Bengal Chamber of Commerce.

125. The first objection does not require any lengthy discussion. An increase in the duty on steel bars will undoubtedly tend to raise the cost of such steel as the agriculturist ordinarily uses, but that quantity is very small. If all the steel bars imported into, or produced in, India were used for no other purpose than to provide the agriculturist with steel, an increase of the duty to 30 per cent. would mean an annual burden of about Rs. 43 lakhs spread over a population of 300 millions, or much less than one anna a head. We agree with the Director of Industries, Bihar and Orissa, that the direct effect of protection for steel on agriculture is negligible, and that the cultivator will be affected, if at all, mainly through any consequential increase in Railway rates that might result, to which we might add the increased cost of bridges in rural areas. It would be different if it were intended to impose a protective duty on agricultural implements generally. But only one such proposal has come before us and it is of very restricted scope.

The direct effect upon agriculture of protection for steel.

126. The second objection also need not detain us long. In so far as the argument is valid at all, it is a general argument against any measure designed to secure the development of industries in India on a large scale and has no special application to steel. The development of Indian industries is, we understand, the accepted policy of the Government of India, and in so far as it is successful it must tend to reduce imports, for the time being at any rate, whatever the ultimate effects may be. We should stultify ourselves if we admitted that the natural consequences of the policy are arguments against any attempt to carry

Reduction of imports and exports and restriction of the market for agricultural produce.

it out. Mr. Pilcher in his oral evidence suggested that the reduction of Indian imports, and consequently of exports, was open to objection—(*a*) because it was produced by artificial means and not the result of natural and healthy development, and (*b*) because it meant the sudden displacement of a large body of imports. The answer is that the steel manufacturer has no choice. Since large units are essential to cheap production, a policy of slow and imperceptible growth is out of his power. The industry must develop by sudden jumps or not at all. Quite apart from any question of protection, moreover, the increased Indian production of steel is imminent and the new plant at Jamshedpur is almost ready to operate. Unless the manufacture of steel in India is to cease altogether, a heavy reduction in imports is inevitable, since the only chance of cheap production is to utilize the new plant to the full.

Effect of protection for steel upon other industries.

127. The real difficulty we have to meet is the third, and we fully appreciate its importance. Protection for steel must entail some increase in costs to other industries, and we recognise that it is incumbent on us to explore the consequences which must follow the adoption of our proposals. But before we discuss some particular aspects of the case, there is one general point to be cleared up.

Apprehension regarding future developments of protection for steel.

128. The picture of the disastrous consequences of protection for steel, so forcibly presented to us by Mr. Pilcher and the Bengal Chamber, owes its most vivid colouring, we think, to an underlying feeling that the real danger is created not by the policy of discriminating protection accepted by the Government of India and the Legislative Assembly, but by a policy of indiscriminate protection for all kinds of steel. Strong apprehensions were evidently felt that, however the scheme might be limited at the start, the first step would have been taken on a slippery path, and that sooner or later all kinds of steel would be involved in a common fate. But this view involves a doubt as to the possibility of adhering to the policy adopted, and we cannot within the terms of our reference discuss it. We have been appointed to advise the Government of India by what means and to what extent effect can be given to their policy, and objections to the policy itself are beyond our scope. We have to consider the sacrifices which that policy may entail on the community and not the burden which a different policy would bring with it. We are not called upon, therefore, to discuss the remoter consequences which protection for steel may bring in its train. The case might be different if it seemed probable that the cost of steel production were likely to remain at its present level for a long period of years, for existing industries would then have to develop and new industries come into existence on the basis of high steel

costs. But we have found good grounds for believing that production costs will fall substantially in the next three or four years, and in that case the burden will be lightened at no very distant date. If our expectations are justified, the industries which use steel as their raw material will be gradually built up on the basis of steadily diminishing steel costs. This is important because it is the primary cost of raw steel which ultimately determines the level of costs in all the dependent industries.

Effect of our proposals on Railway costs—figures for the East Indian and Bengal Nagpur Railway systems.

129. We now turn to the effect of our proposals upon the Railways. The imposition of protective duties on steel must necessarily involve an increase in Railway expenditure, and it is here that the consequences may be most serious. It is of great importance to the industrial prosperity of the country that Railway rates should be kept as low as possible, and in so far as protection for steel tends to raise rates, or to prevent a reduction which might otherwise have taken place, it is open to obvious attack. The Railway administrations which supplied us with the most complete information were the East Indian Railway Company and the Bengal Nagpur Railway Company. The figures they gave for the increase of expenditure which would result from a 33⅓ per cent. duty are as follows :—

	East Indian Railway.		Bengal Nagpur Railway.	
	Capital.	Revenue.	Capital.	Revenue.
	Rs. lakhs.	Rs. lakhs.	Rs. lakhs.	Rs. lakhs.
Rails, fishplates, sleepers	3·36	4·69	12·26	6·57
Steel in wagons and underframes	11·66	3·00	6·58	1·50
Unfabricated steel	1·26	...	·26	·79
Structural steel (fabricated)	5·05	...	1·96	·98
Total	21·33	7·69	21·06	9·84

These figures make it clear that it is through rails and wagons that protection for steel would chiefly affect Railway costs. We have proposed (paragraph 116 above) to deal with rails by way of a bounty, so that there will be no increase of Railway expenditure on that account. Our recommendations regarding wagons will be submitted in our Second Report, but we may say at once that we shall have no proposal to make for a protective duty on imported wagons. When wagons and rails are deducted, the balance remaining is not large. The East Indian Railway apparently anticipated

that the whole of the other steel will be required on capital account which seems an improbable supposition. The Bengal Nagpur Railway shows three-quarters of the unfabricated steel and one-third of the fabricated steel under revenue. If the requirements of the East Indian Railway are divided in the same proportion, the figures for the two Railways together are—

	Capital. Rs. lakhs.	Revenue. Rs. lakhs.
Unfabricated steel	·58	1·74
Fabricated steel	5·33	2·66
TOTAL	5·91	4·40

The above figures are based on the difference between a 10 per cent. duty and a duty of 33⅓ per cent. The increase of expenditure resulting from our proposals will be about one-half the Railway figures in the case of unfabricated steel and two-thirds in the case of fabricated. The corrected figures for the increase of expenditure in the two Railway systems will then be—

	Capital. Rs. lakhs.	Revenue. Rs. lakhs.
Unfabricated steel	·29	·87
Fabricated steel	3.55	1·77
TOTAL	3·84	2·64

Estimated cost of higher duties on steel to all Indian Railways.

130. The total capital outlay on the East Indian Railway and Bengal Nagpur Railway together is nearly a fourth of the total capital expenditure on all the Indian Railways and in 1922-23 they were responsible for about one-fifth of the working expenses of all Railways. On this basis the increase in the capital expenditure of all the Railways would be Rs. 15·4 lakhs capital and Rs. 13·2 lakhs revenue, or about Rs. 29 lakhs in all. These figures are approximately 0·7 per cent. of the capital outlay and 0·2 per cent. of the working expenses of all the Indian Railways in 1922-23. It does not seem probable that the Railway rates and fares would be seriously affected by increases of this order of magnitude, and in fact the increase in working expenses would be fully counterbalanced by a reduction of something less than 4 annas a ton in the cost of coal.

The tariff on machinery.

131. Before we can discuss the effect of protection for steel on Indian industries generally, it is necessary to explain the position as regards machinery. The question to what extent the manufacture of machinery in India is likely to be affected by protection for steel is a very important one, but we have found it

impossible to investigate it fully in our present enquiry. The subject is intricate and demands a closer and more detailed examination of the facts than we could attempt, if we were to do justice to the major question of protection for steel. But even if considerations of time had not interfered, there would still have been difficulties. Any enquiry into the tariff on machinery necessarily raises certain general questions not specially connected with steel, and we could not, within the terms of our reference, discuss fully these wider issues. We believe that the proposals we have made regarding steel will, if accepted, necessitate a very early inquiry into the machinery question, but in that case the cost of steel will be only one of the factors in the problem. For these reasons we have no proposals to make at present regarding machinery, and all articles which under the present tariff are classed as machinery will be unaffected. But before passing from the subject it seems desirable that we should draw attention to certain aspects of the case which are apt to be overlooked.

The principle of discriminating protection and its application to the tariff on machinery.

132. In the arguments against protection for steel which have been placed before us, it has usually been assumed that higher import duties on raw steel necessarily entail high protective duties on all classes of machinery, and on that basis it is easy to show that a heavy burden would be imposed on most industries. But in accordance with the principle of discriminating protection which has been laid down for our guidance, all classes of machinery which are not manufactured in India are excluded, and this eliminates at the outset a great deal more than half of the machinery imported. In the second place, so far as machinery is composed of materials other than steel, *e.g.*, brass or cast iron, or of special qualities of steel not produced in India, it is unaffected by the increase in the duties we have proposed. It follows that, even if as a result of protection for steel, protection had to be extended to those kinds of machinery which are manufactured in India, a comparatively small increase in the duty might suffice to compensate for the higher cost of steel. Two illustrations of the latter point may be given.

The cost of steel in a winding engine.

133. Messrs. Burn and Company supplied us with the following figures for the cost of a colliery winding engine :—

	Rs.	A.
Present cost price of engine	5,444	8
Cost of steel material including 10 per cent. duty as at present charged	736	10
Cost of steel material including 33⅓ per cent. duty . .	892	13
The extra cost of steel material due to this increased duty is therefore	156	3
This is equivalent to an increase in the cost of manufacture of	3 per cent.	

The increased cost resulting from our proposals will probably not be more than Rs. 100, or about two per cent. of the cost of the engine. In this case clearly the compensating protection required is not very heavy.

The cost of steel in jute machinery.

134. The second illustration is taken from jute machinery. Three firms manufacturing such machinery came to our notice, of whom two sent us written statements, and we also examined a representative of one of them orally. This gentleman (Mr. Combe of Fairbairn, Lawson, Combe and Barbour (India), Limited) supplied us at our request with a statement showing the various kinds of iron and steel which his firm required for the manufacture of jute machinery. The total quantity required for normal operation is 200 tons a year and the list is as follows:—

	Cost c. i. f. Calcutta per ton.	Quantities tons.
	Rs.	
(*i*) Drawing rollers of drawings and rovings (steel) .	328	21¾
(*ii*) Drawing and retaining roller of spinnings (wrought iron)	245	39¼
(*iii*) Faller steel for drawings and rovings . .	400	41
(*iv*) Spindle steel	595	36
(*v*) Special free cutting steel for studs . . .	227	23¼
(*vi*) Bright drawn bars commercial . . .	Not given	38½

All these items except (*ii*) and (*vi*) are steel of special qualities and as such will not be affected by the specific duty of Rs. 40 a ton which we have proposed for common steel bar. The wrought iron (item *ii*) is also of a superior quality and will remain subject to the present tariff, while the bright drawn bars (item (*vi*)) fall under the entry in the steel schedule " Bar, galvanised, tinned, planished, polished or lead coated " which we have left unchanged. But even if items (*ii*) and (*vi*) had become subject to the specific duties we have proposed for common iron and steel bars, the increase in the firm's annual costs would have been only about Rs. 1,600, about 2 per cent. of the cost (delivered at works) of all the iron and steel bars used by the firm for the manufacture of jute mill machinery.

High proportion of steel in certain kinds of machinery.

135. We have thought it worth while to give these illustrations at length, because they bring out the point that detailed enquiries are necessary before the effect of the steel tariff on machinery costs can be ascertained. Cases have also come to our notice in which certain articles now classed as machinery will be much more seriously affected by our proposals. Thus,

for example, the cost of pit-head gears and towers for electric transmission lines—both of them structures of fabricated steel—will be increased to the Indian manufacturer to much the same extent as bridgework. Again, common steel bars are used by some of the engineering firms for the manufacture of shafting, and here also costs will go up substantially. But in general, very few cases were brought to our notice where the cost of machinery was likely to be heavily enhanced by an increase in the steel duties.

Tea garden Machinery.

136. In his written statement Mr. Pilcher drew our attention to the manufacture of tea garden machinery in India and remarked that "at least one engineering concern, for long associated honourably with the supply of tea manufacturing machinery to the gardens, is threatened with heavy loss on its Indian investments in the event of the imposition of a prohibitive tariff on steel". We enquired from Mr. Pilcher, during the course of his oral examination, whether he could give us the name of the firm to which he referred, but he explained that he was not at liberty to do so. No representation was in fact made to us by any firm which specialises in the manufacture of tea garden machinery. During the course of our stay in Calcutta we visited the works of Messrs. Marshall, Sons & Company (India) Ltd., an engineering firm which supplies a considerable quantity of machinery to the gardens. This firm did not, however, send us a written representation or request us to take oral evidence. In these circumstances we can only infer that steel is not so important a factor in the cost of tea garden machinery as Mr. Pilcher was led to believe.

Effect of protection for steel on Indian industries generally.

137. We should have been glad if it had been possible to examine in detail the effect of increased *duties* on steel on at least the principal Indian *industries*. But this could not be done satisfactorily except on the basis of information supplied by the industries themselves, and we have not had the advantage of examining witnesses who were in a position to speak with authority on their behalf. In September 1923 we invited the Indian Mining Association and the Indian Mining Federation to state their views on the general question of protection for steel, but both bodies explained that they were unable to do so. Subsequently, however, the Association sent us copies of the replies received to a circular letter on the subject addressed to its members. The Indian Jute Mills Association sent us a written representation on the 1st December, but explained that they did not wish to nominate any witness for oral examination. Mr. Pilcher assured us in his written statement that there was complete unanimity among the promoters of the

tea industry in resenting a prohibitive duty on steel, but no communication of any kind was received from the Indian Tea Association except on the quite subsidiary topic of the removal of the duty on sulphur. Coal, jute and tea are the principal industries in the economic area of which Calcutta is the centre, and the Bengal Chamber of Commerce, which is the natural mouthpiece of the European commercial community in that area, gave emphatic expression to the view that protection for steel would be most detrimental to all of them. But unless those who are best acquainted with the facts come forward to state them, the materials for a full review of the position do not exist. We cannot therefore attempt to deal with the subject in detail. It may, however, be useful to say something regarding the probable effect of our proposals on the jute industry in so far as the data supplied in the letter from the Jute Mills Association and in Mr. Pilcher's written statement enable us to do so.

Effect of our proposals on the jute industry.

138. The effect of our proposals on the cost of jute mill machinery has already been dealt with (paragrapn 134 above) and need not be referred to again. It is mainly through the duties on structural steel that the industry will be affected. Mr. Pilcher has given us figures for one important group of mills which show that the original cost of the steel work in the buildings amounts to 8·8 per cent. of the total block. This figure is in good agreement with another figure arrived at in a different way. The Association say that, so far as original construction and equipment is concerned, 75 per cent. of the block expenditure is required for constructional steel, machinery, engines and plant generally. Mr. Pilcher, on the other hand, states that the custom in the jute trade is to divide the value of mill block into two shares—one-third of the outlay being assigned to buildings and two-thirds to machinery. The inference is that the value of the constructional steel on the average is one-twelfth (8·3 per cent.) of the total block. On this basis the figures work out as follows—

	Rs.	A.
Pre-war cost of a new mill per loom	6,000	0
Pre-war cost of constructional steel per loom . .	500	0
Present cost of constructional steel per loom (50 per cent. above pre-war rates)	750	0
Duty on constructional steel per loom at 10 per cent. .	75	0
Duty on constructional steel per loom at 25 per cent .	187	8
Increased cost per loom due to higher duty on steel .	112	8

It will be seen that the increased cost per loom is Rs. 112-8-0 which is 1¼ per cent. of Mr. Pilcher's estimate of Rs. 9,000 as the total post-war cost per loom, and 0·7 per cent. of the Association's

figure of Rs. 16,000. If the latter figure is correct, costs are now 167 per cent. above pre-war rates, but whatever the explanation of this abnormal increase may be, it cannot be due to the cost of constructional steel.

Increased cost of new construction in the jute industry resulting from our proposals.

139. Mr. Pilcher refers to the ambition of the industry to maintain a steady ten per cent. increase in the number of looms operating, and remarks that new construction should, therefore, given healthy conditions, be maintained in the region of 4,400 looms per annum. On that basis the increased cost due to the higher duties on constructional steel would be about Rs. 5 lakhs. An industry which doubled itself every eight years would, however, be unusually prosperous, and the more modest estimate of a five per cent. increase in the number of looms operating would mean an additional cost on the capital side of only Rs. 2½ lakhs annually. It does not seem likely that this would prove a very severe handicap to the development of the industry.

Increase in working expenses of the jute industry resulting from our proposals.

140. The Indian Jute Mills Association estimate the amount spent by the mills per annum on imports of raw steel and spare parts made of steel is about Rs. 57 lakhs, this figure being calculated on the basis of the actual expenditure on these accounts of several representative mills during the past three years. At least half this expenditure must, we think, be incurred either on articles which are classed as machinery, or on steel of special qualities the duties on which will not be raised. The expenditure affected by our proposals may therefore be taken as Rs. 28 lakhs, of which Rs. 2·56 lakhs represents the present 10 per cent. duty. The new duties at 25 per cent. (bars are higher, and structural shapes, plates and sheets a good deal lower) would amount to Rs. 6·40 lakhs and the increase in expenditure is Rs. 3·84 lakhs. It is possible that the jute mill costs may be raised by the increased price of steel in other ways to which our attention has not been drawn. But even if allowance is made for these, it does not seem likely that the cost to the industry will be more than Rs. 5 lakhs annually. As there are 51 jute mills the incidence is about Rs. 10,000 a year per mill.

General conclusion regarding the burden on industries.

141. In the last two paragraphs we have arrived at a figure of Rs 7½ lakhs (Rs. 5 lakhs working expense and Rs. 2½ lakhs capital) as the additional burden placed on the jute industry by the increase in the duties on steel. The data supplied to us do not permit us to carry the calculation further, and it is possible that, if we had had the advantage of investigating the question in oral examination, we might have arrived at a different figure, whether

higher or lower. But the estimate of Rs. 7½ lakhs is not an unreasonable one and is of the order we should have expected. If it is approximately correct, it seems a fair inference that, apart from the engineering firms, which are on a totally different footing, no one industry is likely to be saddled with an unduly heavy burden. In the absence of the necessary data, we cannot calculate the burden on other industries in a similar way and so work up to the total burden upon all the main industries. But it is possible to approach the question from the other side. The total burden which has to be distributed can be calculated approximately from the Trade Returns, and starting from this end we can work downwards to an estimate of the share falling to the principal industries. It is from this point of view that we shall approach the subject in our Second Report. The evidence we have obtained suggests generally that about one-third of the burden will fall on the Railways, other Government departments and public bodies, one-third or something less on the principal industries, and the balance on the minor handicrafts and the general consumer. So far as we can judge, the burden will be widely diffused and is not likely to press too heavily on any one section of the community.

Probable consequences of cessation of steel manufacture.

142. Our general conclusion regarding the cost to the country of protection for steel has been indicated at the end of the last paragraph. We have no desire, however, to minimize the consequences of what we have proposed. Protection for steel involves a real burden on the community and a temporary sacrifice in order to secure advantages in the future. If we did not believe that the sacrifice was temporary and the advantages more than commensurate, we should have had no proposals to lay before the Government of India. In so far as these advantages lie in the future, there is no need that we should dilate upon them here. They arise naturally from the firm establishment of a great industry which is essential to national security and for which India possesses great natural resources. But it is worth while to consider briefly what the consequences would be if protection were withheld and the manufacture of steel in India were to cease. A large number of workmen would be thrown out of employment and the industrial training they have gained at Jamshedpur would be to a large extent wasted. A very serious blow would also be inflicted on the coal industry owing to the sudden drop in the demand for coal. These, however, are not the most serious results. The development of India's natural resources for steel manufacture would be postponed indefinitely, for we have no hope that, at the present level of prices, fresh capital would be forthcoming or that another firm would enter the business. Finally, and this is the gravest consequence of all, the shock to public confidence in the future of

Indian industries would be extreme. It has long been recognised that the progress of industrial development in India will be slow until Indian capital is forthcoming in much more abundant measure than it has been in the past. The complete collapse of the greatest single industrial enterprise in the country would put back the clock for twenty years at least. We do not claim that these considerations are decisive. But they are factors which must be taken into account in arriving at a decision on a momentous issue.

CHAPTER X.

Summary.

143. Before concluding this Report it is desirable that we should summarise the main conclusions at which we have arrived and the proposals we have made.

Summary.

(1) The Steel industry satisfies the three conditions which the Fiscal Commission considered should be satisfied in ordinary cases by all industries before a claim to protection is entertained. It is also an essential industry for purposes of self-defence and of great importance on national grounds. It might therefore claim protection even if the ordinary conditions were not fully satisfied.

(2) India possesses a great natural advantage for the manufacture of steel owing to the richness and abundance of the iron ore deposits and the comparatively short distance which separates them from the coalfields.

(3) The quantities of coking coal available are sufficient for the requirements of the industry for a century or more unless its growth is unexpectedly rapid, and the supplies of limestone and dolomite are ample. These materials are not equal in quality to those available in some other countries, but they are good enough for their purpose and are not more expensive than elsewhere.

(4) Most of the other raw materials required, and also the materials for refractory bricks, exist in India in sufficient quantities.

(5) The Indian market for steel is already large and is likely to grow. In respect of labour India is at present at a disadvantage which will be removed as the workers acquire skill and experience.

(6) At the present level of world prices steel manufacture in India is carried on at a loss. Unless protection is given, there is no hope that it will develop for many years to come, and there is a serious danger that it may cease altogether.

(7) India already produces pig iron more cheaply than other countries and the possibility of producing steel of thoroughly sound quality has been proved. It has not hitherto been found possible, however, to combine a high output with satisfactory quality. As soon as this has been done, the future of the Indian steel industry is assured.

(8) It is probable that the cost of steel production in India will fall substantially in the next three or four years, and there is a reasonable assurance that at no very remote date Indian steel will be able to hold its own in competition with imported steel without protection.

(9) The need for protection is measured by the difference between two prices—

(*a*) the price at which steel is likely to be imported into India from abroad, and

(*b*) the price at which the Indian manufacturer can sell at a reasonable profit.

(10) The prices at which steel is likely to enter India without duty have been found to be as follows :—

	Per ton. Rs.
Bars	140
Structural shapes, *i.e.*, angles, beams, channels, etc.	145
Rails, 30 lbs. and over	140
Plates, ordinary	150
Sheets, black	200
Sheets, galvanised	300

(11) The average price which gives the Indian manufacturer a fair return on his capital has been found to be Rs. 180 a ton.

(12) Except in the case of sheets, the proposals made for the imposition of duties, or the grant of bounties, approximately bridge the difference between the two prices. If, owing to a fall in the price of imported steel, the duties no longer give adequate protection, additional or off-setting duties should be imposed, and the Government of India should take powers by legislation to impose such duties.

(13) The operation of the proposals made is limited to a period of three years, both because of the uncertainty as to the future course of world prices, and the probability of a decided drop in the cost of production. A fresh enquiry will probably be necessary in 1926-27.

(14) The proposals made have been so framed as to interfere as little as possible with those kinds of steel which are not produced in India at present and are not likely to be produced for some time to come.

(15) It is proposed that the following specific duties should be imposed :—

	Per ton Rs.
Steel–	
Structural shapes, *i.e.* beams, angles, channels, etc.	30
Ship, tank and bridge plates	30
Common merchant bars and rods	40
Light rails (under 40 lbs.)	40
Black sheets, whether plain or corrugated	50
Galvanised sheets, whether plain or corrugated	45
Wrought iron—	
Angles, channels	20
Common bars	35

(16) The necessity for imposing tariff duties on certain kinds of wrought iron arises from the fact that the commoner qualities can be used for many purposes for which steel is used, and would displace steel if there were an appreciable difference in the prices.

(17) Iron and steel sections of superior qualities remain subject to the present tariff and will not be affected by the new duties proposed.

(18) It is proposed to grant bounties on the manufacture of medium and heavy rails and fishplates according to the following scale :—

	Per ton. Rs.
1924-25	32
1925-26	26
1926-27	20

The present *ad valorem* duty would be converted into a specific duty of Rs. 14 a ton.

(19) The grant of protection to the manufacture of steel must necessarily increase the costs of many branches of the engineering industry at a time when it is holding its own with difficulty in the face of intense competition from abroad. The adoption of the proposals made will necessitate an increase in the duty on fabricated steel to at least 20 per cent., and possibly to 25 per cent. in some cases.

(20) The sacrifice which the country is asked to make in order to preserve the steel industry is temporary and the advantages to be gained are more than commensurate. The burden on the consumer is likely to be widely diffused and is not likely to press with undue severity on any one industry, or any one section of the community.

G. RAINY,
President.

P. P. GINWALA.

V. G. KALE.

G. C. F. RAMSDEN,
Secretary.

ANNEXURE.

Report by Dr. Fox of the Geological Survey Department, on the Mineral Resources of India for a Domestic Steel Industry.

1. *Letter, dated 12th January 1924, from Dr. Pascoe, Director, Geological Survey of India, to the Tariff Board forwarding Dr. Fox's Report.*

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I have the honour to forward under cover extracts from a report by Dr. C. S. Fox, Officiating Superintendent, Geological Survey of India, on " The Mineral Resources of India for a Domestic Steel Industry ". I have not been able to check all Dr. Fox's figures, but these seem to have been derived mostly from the Mineral Reviews and other publications of my Department. With his general views I am in close agreement.

2. The subject of the available supplies of coking coal in India is, I understand, an important one from the point of view of the Tariff Board. Unfortunately, it is not only one on which very little information is available, but is also a question on which it is extremely difficult to make definite statements. I will enlarge on these difficulties in the course of my attempt to give you some rough idea of what is known as to the amount of coking coal available in India.

3. To begin with the two most important coalfields, Raniganj and Jharia, our information of these is of the scantiest. It is impossible to make any reliable estimate without being able to correlate the various seams in the fields, and this will not be possible until the area has been thoroughly and efficiently surveyed on a large scale. The Geological Survey of India have for a long time been fully alive to the necessity of such a survey, and the necessary preliminary topographical survey is now in the process of being carried out on a scale of 4 inches to the mile. As soon as sheets of this topographical survey are available, a geological examination will be commenced and an endeavour made to correlate the seams and reach some reliable conclusion as to the quantity of coking coal available in the two fields.

4. In 1913, Sir Henry Hayden estimated that the reserves of first-class coal at depths up to about 1,000 feet in Raniganj and Jharia totalled something like 1,378 million metric tons. The Coalfields Committee in 1920 estimated that the Raniganj field contained 518 million tons of so-called " first-class " coal, and that the addition of the Jharia reserves would bring the total for the

two fields up to nearly 1,000 million tons. It was thought by the Committee that an appreciable percentage of this might have been destroyed by intrusive igneous rock. During the same year in which the Coalfields Committee's report was written, Mr. R. R. Simpson, Chief Inspector of Mines, assuming that it was possible to work coal of a " superior quality " to a depth of 1,500 feet, or to a distance of 10,000 feet from the outcrop, came to the conclusion that the total quantity of superior-quality coal in the Raniganj and Jharia fields totalled something like 1,863 millions of tons, after making an allowance for coal damaged by igneous intrusion. Of this reserve Mr. Simpson estimated that not more than two-thirds would be suitable for the production of coke. Mr. Simpson's figures would therefore lead us to the assumption of a reserve of *1,242 million tons of coking coal.*

5. How much of this 1,242 million tons it would be possible to use under present economic conditions for metallurgical purposes, it would be difficult to say. The question is an economic one. The higher the ash-percentage of the coke, the less efficient is that coke for metallurgical purposes. The ash-percentage of the coke thus affects the cost of production of pig iron and steel. Coke with a 20 per cent. ash content can, I believe, be used profitably under present conditions in India, but under different economic conditions it would no doubt be possible to utilize coke with a higher ash content. It is perhaps worth pointing out that the above-mentioned 1,242 million tons of coking coal falls under the category of superior coal, and it seems therefore justifiable to conclude that the coke derived therefrom would be of a comparatively high grade.

6. The next coalfield we may consider is that of Giridih. This is a small field, containing a reserve which was estimated by Mr. Simpson in 1920 to consist of some 70 million tons of coal yielding a first-class coke. Most of the Giridih coal is owned by Government. Dr. Coggin Brown's recent estimate of the Giridih reserves comes to about *60 million tons.*

7. The Bokaro field is said to contain over *600 million tons of coking coal.* I have very few reliable figures regarding this field, but the coke, on the whole, is hard and the ash-content somewhat high. Owing to the latter fact, it is a matter of present dispute as to whether the " run-of-mine " coal would at present be profitably utilizable for metallurgical purposes or not. Recent experiments, carried out by Mr. W. Randall, show that it is possible to clean the " slack " of the principal Bokaro seam, the Kargali seam, and produce a coal yielding a little over 14 per cent. of ash and therefore fit for the manufacture of a coke which could be used at the present day for metallurgical purposes. The percentage of " slack " in an Indian coalfield averages about 13 per cent.,

so that in the Bokaro field there is at least *78 million tons* of potential "slack", which, after Froth Flotation treatment, would yield a product cheap enough and sufficiently suitable to be used for the preparation of a coke utilizable under present economic conditions for metallurgical purposes. By breaking up the "run-of-mine" coal, successive fractions of what we may designate "artificial slack", decreasing slightly in quality, could be obtained. In this way it is probable that as much as 30 per cent. of the output from the Kargali seam could be used remuneratively under present economic conditions for metallurgical purposes. Under changed economic conditions it would no doubt be possible to make use of a large proportion of—perhaps all of—the "run-of-mine" coal for the same purpose. The estimate of 600 million tons is probably a conservative one. Dr. Brown's estimate is *650 million tons* from the Kargali seam alone. The other seams in Bokaro are small in comparison, and have so far yielded only an inferior grade of coke. Taking Dr. Brown's figure of 650 million tons as covering any possibilities in these small seams, we may assume from the above considerations that by Froth Flotation treatment—which, it is claimed, can be carried out profitably—there is 195 million tons of coal in Bokaro capable of yielding a coke which could be used under present conditions for metallurgical purposes. Under different conditions, probably the whole 650 million tons, after being cleaned, could be used.

8. So far there have been no reports of the occurrence of coking coal in North Karanpura, and this field must be left out of the calculation. Of South Karanpura we have very little more information. The coal from a very limited number of tests yields a soft coke, but when mixed with a coking coal from Jharia, it is said to have produced a coke superior to the coke produced from the Jharia coal alone. The precise significance of this is not understood, and it should, I think, not be concluded that the Karanpura coals are incapable of producing any first grade coke until further experiments have been made. It is not far from the Bokaro coal, and one would rather expect to find that some of it at least possesses good coking qualities.

9. Large reserves of coking coal are known to occur in various parts of Assam, but cannot be used for metallurgical purposes until some means have been found to eliminate the large percentage of sulphur (about 3 per cent.). The four fields of Makum, Namchik, Darangiri and Nazira contain over 250 million tons of coal within a few feet of the level of the plains. Should some method of removing this sulphur be discovered, all this coal would yield a first-class coke with an unusually low ash percentage. Such a discovery would at the same time probably make it economically possible to mine below the surface, in which case the

amount available may be double or treble the above amount. It is unfortunately separated by several large rivers and a considerable distance from the iron-fields and smelting works.

10. The western parts of the large Sohagpur coalfield have been reported to show no coking coal, but a more recent authority states that part of the coal, which is of good quality, cokes well. Some of the coal in the south of the neighbouring Jhilmili field is said to have coking properties.

11. The coals of the Central Provinces all seem to be non-coking, and the same may be said regarding Talchir and Singareni, and of the smaller Central India and Bihar fields such as Singrauli, Ramkola, Tatapani, Hutar, Karasia, Korea, etc.

12. The figures quoted above regarding quantities of coking coal apply to what have been termed " available supplies ". It is impossible to make certain of what is precisely intended by this term and whether it makes any allowance for waste in extraction. Mr. Trehearne Rees calculated that the proportion of coal recovered from Indian mines averaged about two-thirds of the total quantity present. It is probable that no allowance has been made for this in estimating " available supplies ", and it will be assumed that one-third of the available supplies will be wasted in extraction. The above results may now be tabulated as follows :—

A. Amount of finally available coal capable of yielding, after cleaning treatment or otherwise, a coke utilizable profitably under present conditions for metallurgical purposes.

Raniganj and Jharia	1,242	million tons.	
Giridih	60	„	„
Bokaro	195	„	„
Other areas, say	50	„	„
	1,547	„	„
Deduct—one-third waste	516	„	„
Total finally available	1,031	„	„

B. Amount of finally available coal capable of yielding, after treatment or otherwise, a less efficient coke for metallurgical purposes.

Raniganj and Jharia	1,242	million tons.	
Giridih, say	60	„	„
Bokaro	670	„	„
Other areas, say	100	„	„
	2,052	„	„
Deduct—one-third waste	684	„	„
Total finally available	1,368	„	„

To the latter total can be added $\frac{2}{3}$ of say 600 = 400 million tons of Assam coal which would yield a first-class metallurgical coke, provided some means of eliminating the sulphur were discovered and transport difficulties successfully overcome. This gives a grand total of *1,768 million tons of coking coal.*

13. From the above remarks it will be clearly seen that the amount of available coking coal depends upon the grade of coke required, and the grade of coke depends upon economic factors, such as the market price of pig-iron, protective duties, etc. The supplies may also be increased by judicious mixing. I need hardly point out that the figures quoted in this letter are nearly all rough approximations only, and may be half or double the true amounts. My opinion is, however, that a deficiency in one figure may be to a greater or less extent balanced by an excess in another, and that the totals are, if anything, on the conservative side. The Raniganj and Jharia estimate may, for instance, be too large, but the Bokaro estimate and the *nil* figure for Karampura are more likely to be too small. I think it is safe to conclude that, assuming 3 tons of coking coal to be necessary to produce $2\frac{1}{4}$ tons of coke, there is enough coking coal in India to supply the iron and steel industry with 4 million tons of metallurgical coke per annum for the next 150 years at least.

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2. *Report by Dr. Fox*

on the Mineral Resources of India for a Domestic Steel Industry.

I have found it most convenient to discuss the various mineral substances—so-called raw materials under the following heads :—

1. Iron Ore.
2. Coking Coal.
3. Fluxes.
4. Modifying Metals.
5. Refractory Materials.

I. Iron Ore.

It has long been known that India possessed valuable deposits of iron ore, but exactly how valuable has only recently been proved. In consequence of investigations within the last twenty years it has been shown that India possesses extremely valuable deposits of high grade iron ore which had not previously been included in the estimates of the world's reserves. Already the names

Mayurbhanj, Bonai and Keonjhar are familiar in industrial circles and, in India, better known than the occurrences of Lorraine, Mesabi and Wabana. The chief types of iron ore in India which have attracted attention are, magnetites, laterites, clay iron stones, and hematite. Hematite enters into the composition of the other three types and is in itself the most important class of ore now being worked in India. I propose to discuss them in the order named.

Magnetite.—The largest deposits of magnetite, " estimated in thousands of millions of tons " (see paper by Aloke Bose in the Journal of the Iron and Steel Institute, Vol. LVXXXIX, 1914, pages 528-542), occur in the Salem district of Madras, " but the scarcity of fuel makes it impossible to work the deposits on a large scale." The principal occurrences are those of (1) Godamalai, " where the main bed has an average thickness of between 50 and 100 feet, and forms precipices several hundred feet high " (brochure on ' Iron Ore ', Imperial Mineral Resources Bureau); (2) Thalaimalai-Kolimalai; (3) Singapatti and Singapuram; (4) Thirtamalai; and (5) Kanjamalai, where the two lowest beds measure 50 and nearly 100 feet respectively in thickness. " The total quantity of ore available is considered to be practically inexhaustible ". Other valuable deposits occur in the Nellore district and elsewhere in the Madras Presidency.

Laterite.—These ores, which are normally hydrated oxide of iron frequently limonitic and often hematitic, nearly always contain appreciable amounts of alumina (primary laterite) or silica (as quartz in detrital laterite). It is difficult to give an adequate idea of the enormous quantities of this class of ore in India. The laterite ores are of low grade and not particularly attractive.

Clay Ironstone.—These ores are invariably found interbedded among the coal-bearing strata of the Indian coalfields. They seldom prove to be carbonate ores and, although ' blackband ' ironstone often occurs, the ore is distinctly hematitic in character. The best known occurrence of Clay Ironstone in India is that of the Ironstone shale beds in the Raniganj Coalfield, where it occurs as a stage between the Barkar and Raniganj beds. The ore used in the Barakar Iron Works at Kulti during 1889-1905 contained as much as 46 per cent. Fe (iron). The analysis quoted being :—65 to 66 per cent. ferric oxide, over 2·5 per cent. manganese oxide, up to 2 per cent. lime and magnesia, from 5 to 9 per cent. alumina, 10 to 13 per cent. silica, 10 to 12 per cent. combined water, ·09 to ·44 per cent. phosphorus and a trace of sulphur. Since 1914 those iron works have discontinued using clay-ironstone ore and obtain their ore supplies from the hematite deposits of Kolhan (Singhbhum) near Manharpur. Occurrences of clay-ironstone are known in the coalfields of Upper Assam, of Aurunga

(Bihar and Orissa), and elsewhere but it is unlikely these ores will be worked until the hematite deposits of Singhbhum and Orissa are exhausted.

Hematite.—Perhaps the most valuable iron ores in India at the present time are the hematite ores of Singhbhum and Orissa in what is known as the ' Iron Belt '. This tract extends from the deposits of Gurumaishini in Mayurbhanj State westwards through the Keonjhar and Bonai areas to the Subdivision of Kolhan in Singhbhum. Both in quality and quantity these ores are thought to exceed any other ores of the same kind, including the great American occurrences of Minnesota, Wisconsin and Michigan.

Quality.

The quality of the ' Iron Belt ' ores can be gauged from the following analysis :—64·0 per cent. Fe (iron), 0·05 per cent. manganese dioxide, 2·1 per cent. silica, 0·05 per cent. phosphorus, 0·002 per cent. sulphur, 0·15 per cent. lime, 0·18 per cent. magnesia and 1·25 per cent. alumina. The above represents a bulk lot, sampled from the workings of the Bengal Iron Company (Barakar Iron Works) of Kulti at their mines on Pansira and Buda Buru Hills near Manharpur on the Bengal Nagpur Railway. In analyses of ore from other deposits in the ' Iron Belt ' the iron content often ranges up to 68 per cent. Apart from their high metal percentage these ores are notable for their low sulphur total which is never more than 0·6 per cent. The phosphorus percentage varies but averages 0·08 per cent. Manganese also varies—rarely more than 1 per cent. in the steely ores, it may equal the iron content in certain porous ores.

Reserves.

Recent estimates of the hematites of the ' Iron Belt ' as given by Mr. H. C. Jones of the Geological Survey of India are for ores containing not less than 60 per cent. Fe (iron), as follows :—

Singhbhum District	1,074	million tons.
Keonjhar State	806	,, ,,
Bonai State	656	,, ,,
Bonai or Keonjhar ?	230	,, ,,
Mayurbhanj State	16	,, ,,
Total "Iron Belt"	2,832	,, ,,

Mr. E. Parsons calculated that the proved quantity of 60 per cent. ore in the same area was not less than 3,000 million tons, while Mr. C. P. Perin goes so far as to say that in the quadrangle, 400 miles east to west by 200 miles north to south (with Calcutta at the north east corner) there are 20,000 million tons of high grade ore at an average distance of 125 miles from the Bengal coalfields. It is thus seen that these ores alone will be more than sufficient for

the requirements of the Indian ironmasters of 1928 for 1,000 years at the projected output of 1,500,000 tons of pig iron annually.

Other Hematites.—In addition to the great hematite deposits of the ' Iron Belt ' there are also other valuable occurrences which call for mention—particularly those of the Central Provinces, Mysore and Kumaon.

The occurrences of Lohara and Pipalgaon in the Chanda district and the deposits of Rajhara (Dondi-lohara) in the Drug district are said to be the most important hematite ores of the Central Provinces. The Chanda ores average 61 to 67 per cent. Fe (iron), 1·5 to 11·04 per cent. silica, 0·012 per cent. sulphur, and 0·005 per cent. phosphorus. The Lohara deposit constitutes a hill 600 yards long, 200 yards wide and 120 feet high and has been traced for 2½ miles. An unsuccessful attempt was made in 1875 to smelt these ores at Warora. There is a large coalfield in the Chanda district and limestone of good quality occurs in the vicinity of Kandara and Karamgohan. In the Drug district the Rajhara ores are said to average 66 per cent. Fe (iron), 0·058 per cent. phosphorus, 0·108 per cent. sulphur, 1·44 per cent. silica, 0·151 per cent. manganese, and the estimated reserves are computed at 10 million tons. There is good quality limestone at Dalli but the only local fuel is charcoal. The fuel question confronts any project for erecting iron works in the Central Provinces, because the coals in that region are non-coking and high in ash. It is possible that electric smelting may some day be found profitable, in which case the occurrences of manganese ores in the Chhindwara, Nagpur and Balaghat districts may be used in the production of ferro-manganese.

There are several important deposits of iron ore, mixed hematite and magnetite, in Mysore State. Of these the most attractive are those of the Bababudan hills where 25 to 50 million tons of hematite of 60 per cent. quality have been located. The recently established Mysore Wood Distillation and Iron Company have erected iron works for the production of charcoal pig iron, and they have in mind the electrical heating of their furnaces should the fuel question become acute in the event of an expansion in the output.

Two attempts in 1857 and 1877 were made to establish iron works in Kumaon near Naini Tal (United Provinces) but the operations proved unsuccessful chiefly due to lack of fuel. The only local fuel is charcoal; any coke would have to be brought from the Bengal coalfields. To this day we have no precise information regarding the quantities of iron ore at Ramgurh and Dechauri. The former is a siliceous ore carrying 42 to 60 per cent. iron while the latter, a scaly hematite averaging 39 to 55 per cent. iron, is aluminous.

Type.	Deposits.	Reserves.	Composition.			Remarks.
			Fe.	P.	S.	
			Per cent.	Per cent.	Per cent.	
Magnetite	Godalmalai and Kanjamalai, Salem, Madras.	Estimated in thousands of millions of tons. No precise figures.	55	0·3 to 0·62	0·028	Said to be unsuitable for use in blast furnaces. All coke must be imported from Bengal fields.
Laterite	Mallarpur, Rajmahal Hills (Bengal).	Large, unknown . .	43	1·5 P_2O_5	?	Centre of old native industry of Birbhum.
	Kathwara Hills, Jabalpur (C. P.)	49 million tons . .	53	0·146	0·02	Suitable for blast furnaces. Lack of fuel.
Clay Iron stone.	Raniganj Coalfield (Bengal).	At least 400 million tons .	33 to 43	0·09 to 0·41	trace	2·5 per cent. manganese oxide, up to 2 per cent. lime and magnesia, 5 to 9 per cent alumina, 10 to 13 per cent. silica, 10 to 12 per cent. combined water. Used till 1913 in Barakar Iron works at Kulti.
Hematite	Mayurbhanj . .	16 million tons .	60 to 68	0·08	trace to 0·6	Average Kolhan Ore 64 per cent. Iron, 0·05 per cent. Manganese dioxide. 2·1 per cent. silica, 0·05 per cent. phosphorus, 0·2 per cent. sulphur, 0·5 per cent. lime, 0·18 per cent. magnesia, 1·25 per cent. alumina.
	Bonai and Keonjhar .	280 „ „				
	Bonai . . .	656 „ „				
	Singhbhum . .	1,074 „ „				
	Keonjhar . . .	806 „ „				
	Total "Iron Belt" (Singhbhum and Orissa).	2,812 „ „				

Indian Iron Ores—concld.

Type.	Deposits.	Reserves.	Composition.			Remarks.
			Fe.	P.	S.	
Hematite—*concld.*	Singhbhum and Orissa.	2,832 million tons .	Per cent. 60 to 68	Per cent. 0·3S	Per cent. trace to 0·6	These ores lie within 150 miles of the coalfields with coking coal capable of giving metallurgical coke.
	Lohara Chanda (C. P.)	100 „ „ at least	61 to 67	0·005	0·012	Pipalgaon deposit not included. Local limestone good. Wardha Valley coal does not coke, operations in 1875 unsuccessful.
	Rajhara (Dondilohara) Drug (C. P.)	10 „ „ estimated.	66	·058	0·108	Limestone at Dalli. Coke must be imported. Held by Tata Iron and Steel Company.
	Bababudan Hills, Mysore State.	25 to 60 million tons .	42 to 64·5	0·044 to 0·105	trace	Ironworks erected 1922 using charcoal for production of pig iron.
	Ramgarh and Dechauri, Kumaon (U. P.)	Not known . . .	43 to 60 and 39 to 55 respectively.	Not known	...	Ramgarh ore siliceous, Dechauri ore aluminous. Attempts in 1857 and 1877 failed through lack of fuel. No local coal.

2. Coking Coal.

Want of success in Indian iron works in the past was almost entirely due to lack of sufficient suitable fuel. The Barakar Iron Works is the only relatively old established enterprise which has succeeded, and owes its success to the discovery of seams of coking coal of fair quality in its vicinity. The future of the Indian iron and steel industry pivots on the reserves of coking coal available in the Indian coalfields. Doubts have been expressed as to the sufficiency of coking coal for a large domestic iron and steel industry. It has been previously stated that the output of pig iron in India in 1928 may attain 1,500,000 tons annually and would require roughly 2,250,000 tons of Indian coke necessitating the expenditure of nearly 3 million tons of coking coal. The life of the hematite ore deposits was calculated at 1,000 years at the above output of 1,500,000 tons of pig iron. This means that there should be at least 3,000 million tons of coking coal capable of producing a good metallurgical coke. This quantity of coking coal would smelt all the known reserves of hematite in the ' Iron Belt ' of Singhbhum and Orissa at whatever rate of consumption the ore deposits might be used up. The estimate of 3,000 million tons of coking coal allows no margin for coal to be used for any other purpose but that of manufacturing coke.

The Minority Report of the Coalfields Committee (1920, p. 31) says that " India possesses enormous reserves of good quality coal, both coking and non-coking. In place of the 45 years life suggested above, I consider that in the recently proved portions of the Jharia and Raniganj fields and in the Bokaro and Karanpura fields, to say nothing of those fields lying still further to the west, we have at least 300 years supply of good quality fuel available.".

The Majority Report of the Coalfields Committee (1920) speak of the life of the fields as 45 years and they say that " it has been calculated that the Raniganj coalfield alone contains over twenty thousand million tons of coal of all kinds; most of this, however, is inferior, and only 518 million tons have been estimated to be of better, or so-called " first class " quality. The addition of the Jharia reserves of higher grade coal would bring the estimates of the two fields up to nearly a thousand million tons, but this figure may need modification in view of the large quantities of coal now known to have been destroyed in both fields by intrusive igneous rocks. Further to the west the Bokaro field is said to contain over six hundred million tons of coking coal and it is possible that further reserves will be found in the Karanpura field. Apart from these, the only " other coking coal known to occur in any quantity in India is that of Assam, the high sulphur content of which, however, renders it unfit for metallurgical purposes. So far as we know

therefore, India will be dependent for her supplies of metallurgical coke on the group of fields lying in the Damuda Valley and including Raniganj and Jharia; and, although the total amount of coal that they contain is undoubtedly very large, the quantity available for coke manufacture is strictly limited". The above remarks point to an estimate of under 2,000 million tons of coking coal suitable for metallurgical coke, and then with some doubt as to whether this is not an over-estimate.

I find it impossible to arrive at any exact estimate regarding the reserves of coking coal in India. After a careful perusal of the available literature and information on record in the office of the Geological Survey of India the following computations appear trustworthy.

Total Reserves of Coal of all Grades.—The total Indian resources of coal of all classes and grades which are thought to be both workable and available in the important coalfields of India are :—

Giridih	60	million	tons.
Raniganj	21 000	,,	,,
Jharia	20 000	,,	,,
Bokaro	1,520	,,	,,
Ramgarh	3	,,	,,
Karanpura, N.	8,900	,,	,,
Karanpura, S.	75	,,	,,
Aurunga	20	,,	,,
Hutar	9	,,	,,
Daltonganj	9	,,	,,
Rajmahal	210	,,	,,
Talchir	44	,,	,,
Total Bengal and Bihar and Orissa Coalfields	52,350	,,	,,
Makum	90	,,	,,
Namchik	90	,,	,,
Daranggiri	76	,,	,,
Nazira	20	,,	,,
Total 4 Assam Coalfields	276	,,	,,
Satpura Fields	100	,,	,,
Chhattisgarh Region	200	,,	,,
Wardha Valley	400	,,	,,
Total Central Provinces	700	,,	,,

In the above estimates, which total less than 54,000 million tons the percentage of good quality coking coal is barely 5 per cent. (see details below), but all our estimates are in the nature of guesses, and it is by no means certain if all the coal classed as good quality coking coal is really coking coal at all.

Reserves of Good Quality Coking Coal.—In the absence of large scale maps of the various coalfields and in the almost entire lack of complete analyses of Indian coals, it is quite impossible to arrive at a reliable estimate of the quantities of coking coal. The following figures give an idea of the order of the reserves thought by several competent investigators to exist in the chief coalfields :—

Giridih	45	million	tons.
Raniganj	875	„	„
Jharia	400	„	„
Bokaro*	360	„	„
Karanpura†	500	„	„
Total Damuda Valley‡	2,180	„	„
Add—Upper Assam Coalfields	220	„	„
„	2,400	„	„

As stated previously, the amount of good quality coking coal necessary to smelt the iron ores of Singhbhum and Orissa should equal 3,000 million tons, whereas by doubtful calculations it appears only possible to locate 2,400 million tons as a total of good quality coal, irrespective of its coking or non-coking quality. It is thus seen that the quantity of suitable fuel for an extensive iron and steel industry is limited.

There is of course an enormous quantity of low grade coal, the estimates exceeding 50,000 million tons, but this material as found is unsuitable for the production of metallurgical coke. It is clear that if a very large expansion in the Indian iron and steel industry is to take place the promoters of the projected extensions must keep in mind the strictly limited quantity of coking coal in the Indian coalfields.

Quality of Indian Coals.—It is, I think, quite generally known that the best Indian coals are inferior to the average British coals. The coking coals of India appear to be characteristically high in phosphorus and moderately high in ash, judged by European and American standards. The phosphorus finds its way into the pig iron—not always to the advantage of the pig iron, although in some cases more phosphorus (as apatite) is added to produce a phosphoric pig suitable for foundries making light castings. The percentage of phosphorus in normal Indian pig iron necessitates the use of the relatively more expensive basic process in the production of steel. Another disadvantage to the presence of phosphorus in the fuel appears to be that the ferro-manganese obtained from blast furnaces

*This figure is probably considerably too low.

†No report of the occurrence of coal yielding a first class coke in Karanpura has yet been received.

‡This is close to my own figure, but does not allow for waste during extraction.

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contains more than 0·3 per cent. phosphorus—the limit fixed by European makers.

Indian coals are geologically younger than the coals of Europe and America. In Assam coal occurs in beds of Tertiary age (*Makum* and *Namchik*) and in strata of Cretaceous age (*Daranggiri*). The coal seams of Raniganj, Jharia and most of the Gondwana coal-bearing strata belong to the period homotaxially equivalent to the Permian system. The Giridih seams (*Kharharbari*) which are known to produce the best coking coal in India, are of Upper Carboniferous age. The Indian coals, above mentioned, are more liable to spontaneous combustion than foreign Carboniferous coals, evidently because they suffer oxidation more readily when exposed to the air.

Complete analyses of Indian coals are conspicuous by their absence, but so far as it is practicable to do so I have tabulated a few of the usual types of analyses in the accompanying table. Such an arrangement admittedly does not bring out the superior importance of the Raniganj and Jharia coalfields, nor does it truly express the composition of individual seams when several occur in the same field. An ideal table would give the average analysis of each seam in each field. Unfortunately it is not possible to attain this perfection in the attached table.

Analysis of Indian Coals.

Geological Age.	Coalfield.	Reserves in Millions of Tons. Total all classes.	Seam.	Composition.		Ash.	H_2O.	P.	S.	Coke.	Remarks.
				Fixed carbon.	Volatile matters.						
Tertiary . .	Makum .	Tons. 90	...	57·47	40·38	2·15	...	...	2·32	Cokes strongly.	The Tertiary Coals, generally speaking, are bright, jotty and non-laminated, and they contain a larger proportion of volatile matters than coal from seams of older strata; many of them are very friable and susceptible to disintegration under exposure; they do not coke as a rule and the proportion of ash is usually small. They are true coals and not lignites as attested by their composition. The Punjab fuels are lignites.
	Namchik .	90	...	52·9	44·4	2·7	...	...	...	Cakes.	
	Nazira (Assam.)	20	...	57·8	34·1	2·6	5·5	...	...	Cakes.	
Cretaceous .	Daranggiri (Garo Hills)	76	...	49·8	36·3	5·1	8·8	...	...	?	These are bright black lignitic coals which become brown when crushed. They contain specks of resinous matter which may help the coking property.
	Umblay River (Khasi Hills).	? Largest field in Khasi Hills.	...	50·40	35·16	8·6	5·84	...	...	Some of it cokes.	

Analysis of Indian Coals—concld.

Geological Age.	Coalfield.	Reserves in Millions of Tons. Total all classes.	Seam.	Composition. Fixed carbon.	Volatile matters.	Ash.	H_2O.	P.	S.	Coke.	Remarks.
		Tons.									
Permian (Gonduana).	Raniganj .	21,000	Upper Raniganj, Lower-Raniganj Barakar.	49·28	32·30	11·43	6·99	0·088	0·74	The Sanctoria, and other seams give good coke.	The coal in the Raniganj stage is composed of alternate bright and dull layers as in the Barakar seams. The coals of the Barakar group vary greatly in character and quality in various fields. They all have lamented appearance due to alternating layers of bright and dull coal. In general a predominance of bright coal means greater purity and a butiminious quality. The seams to vary in thickness and quality within shorter distances nearly all the seams are inferior in quality to average British coal. The quantity of sulphur and phosphorus is very variable. The average of 31 assays from Raniganj gave—
				52·94	31·76	11·51	3·79				
				59·75	25·13	14·0	1·12				
Damuda (Raniganj-Barakar and Group)	Jharia .	20,000	Raniganj-Stage.	57·26	30·62	10·45	1·68	0·143	0·80	Seams, 14, 15, Bhowra A and 17.	
			Barakar group.	63·77	23·21	11·78	1·25				
	Bokaro .	1,520	Kargali .	51·8	25·2	22·3	0·7	...	...	Coking quality.	
	Karanpura .	8,975	Argada .	...	...	...	...	...	...	Cooking quality.	
	Aurunga .	20	...	36·5	29·2	27·5	6·7	...	...	Cakes weakly.	
	Hutar . .	9	...	55·35	28·0	10·7	5·95	...	...	Cakes . .	
	Daltonganj .	9	...	49·37	27·63	14·67	8·4	...	...	Cakes weakly.	

	Rajmahal	210	Average	42·13	39·50	18·37	...	...	...	P		Per cent.
	Talchir	44	Main Seam	44·8	41·3	8·1	5·8	...	...	Non-coking	H_2SO_4.	0·07
	Korea (C. P.)	16 (Two fields only).	Kurasia field	59·95	25·59	7·62	6·84	...	...	...	P_2O_5.	0·14
	Umaria (Rewa).	55	...	66·71	19·71	8·12	5·46	...	...	...		
	Satpura	100	Mopani field (Chindwara)	48·71	24·26	24·01	2·52	...	0·5	Non-coking. Alone.		
			(Barkui).	46·30	30·43	15·05	8·22	...	...			
	Wardha Valley.	400	Ballarpur field.	45·34	31·09	11·27	12·30	...	1·0	Non-coking		
			Ghugus field.	45·61	33·49	20·90	...	...	...			
	Godavari (Hyderabad).	36 (King Seam only).	Singareni field (King Seam).	56·5	25·25	10·65	7·6	...	...			
Upper Carboniferous. (Gonduana.) Talchir-Kharharbari Group.	Giridih	60	Upper Kharharbari.	60·85	22·51	15·81	...	0·019	0·62	Excellent coke from Lower Seam.	The coal is usually dull coloured and tolerably homogeneous in structure, the layers of every bright jetty coal are few and ill marked. The seams are variable in thickness but uniform in composition. These coals are said to be different in structure to those of the Damuda Valley.	
			Lower Kharharbari.	66·84	24·42	9·15	1·2					

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3. Fluxes.

The modern blast furnace process of reducing iron ores involves the use of limestone as a necessary ingredient of the furnace charge. This substance, calcium carbonate, combines with the impurities in the ore and fuel and forms a molten slag. It is unnecessary to say that the limestone should be as pure as possible not less than 90 percentage $CaCo_3$, and uniform in quality. In the absence of *True limestones* of high quality it is often necessary to employ types containing appreciable amounts of magnesium carbonate. These *Dolomitic limestones* do not produce quite so fusible a slag and consequently involve somewhat higher temperatures in the furnace. The presence of a small percentage of carbonate of iron is not considered as an impurity but silica, alumina, phosphorus, and particularly sulphur are impurities which should not exceed certain stipulated amounts. *Sulphur* is to be avoided in the furnace charge as it is never a desirable constituent in the metallurgy of iron and steel and invariably has to be removed from the metal by costly treatment. Phosphorus is occasionally added to the furnace charge, in the form of the mineral Apatite, in order to produce a particularly fluid cast iron for foundries making light castings. *Silica* is often desirable when there is an excess of alumina in the ingredients of the furnace charge, and *vice versa alumina* is permissible if the charge, usually the ore, is too rich in silica. The object in employing limestone as a flux is to obtain a calcium aluminium silicate slag of definite composition and calculable melting point.

Limestones.—Unfortunately most of the large occurrences of rich limestones in India lie at distances exceeding 200 miles from the existing iron works. The deposits nearer at hand have proved to be unattractive because of the inferior or irregular quality of the material. There is little doubt but that the Indian iron-masters are anxious to procure cheaper limestones of more uniform quality than they now obtain. The Barakar Iron works first obtained their supplies locally from Panchet hill and Hansapathar, they then appear to have mixed the local material with limestone from Maihar (Rewa), and now their supplies come exclusively from the Bisra, Rourkela (Gangpur) area. Similar changes in source of supply has taken place in the case of the Jamshedpur (Sakchi) ironworks, who first got their limestone from Katni and now operate their own quarries at Panposh (Gangpur) and obtain a dolomitic limestone from rocks of the same age as those of Bisra and Rourkela. The limestones of Rohtas (Bihar) although of good quality are not sufficiently attractive in price. The best material would appear to be that of Assam but the freight places this material beyond the pockets of the ironworkers of Jamshedpur and Kulti. The question of limestone for fluxing purposes requires further investigation.

The occurrence between the villages of Devedag and Olherpat on the eastern edge of the Auranga coalfield is recommended for examination to the Indian iron masters.

Dolomitic Limestones.—As seen in the table of Indian limestones the material from Panchet Hill is dolomitic in character. The Cuddapah limestones of Gangpur are interbedded with bands of dolomitic materials. It is from these beds that supplies of flux for Jamshedpur and Kulti are at present obtained—the former use dolomitic material, the latter use limestone. From private enquiries it would appear that the Indian Iron works are quite prepared to accept good quality limestone or dolomitic material with as much as 6 per cent. Silica if the price is reasonable. A massive occurrence of dolomitic limestone occurs in the Maila river half a mile east of Sathbarua (Palamau) which may be worth investigation. Other possible source of supply of dolomitic limestone, are in the Baxa Duars (Bengal) and the Marble Rocks area (Jabalpur, C. P.) but those dolomitic marbles are not attractive because of the distance.

Flourspar.—Although several small occurrences of fluorspar are known in India no workable deposits have been proved. The Tata Iron and Steel Company endeavoured to exploit an occurrence of fluorspar at Barla in Kishengath State (Rajputana), but found that the quantity available was not attractive and the cost of working made the domestic material more expensive than imported fluorspar. The imported quantities are said to average 400 tons annually, so that these supplies will have to be augmented in future if the Indian steel industry expands.

ROYAL ASIATIC SOCIETY

Locality.	Reserves.	Composition.					Remarks.
		$CaCO_3$.	$MgCO_3$.	Al_2O_3 Fe_2O_3.	Silica Insolubles.	Other constituents.	
Katni, Jabalpur, C. P. (Lower Vindhyan).	Practically inexhaustible composition somewhat variable in different places but uniform locally.	94·65	2·98	?	1·79	0·58	Extensively worked. These limestone bands strike steadily eastward and are being worked in Bihar at Rhotas and near Sassaram.
Maihar (Rewa) (Upper Vindhyan).	Practically inexhaustible uniform locally, varies in quality. Along Strike.	96·03	1·75	0·96	1·15	0·11	Largely used for lime.
Bsra (Gangpur) (Cuddapah).	Very large but interbedded with bands of Dolomatic material composition variable.	95·18	1·57	1·04	1·87	0·34	
Sylhet (Assam) (Kirthar)	Practically unlimited for all domestic purposes.	95·4	1·81	1·72	0·58	0·49	
Chela (Khasi Hills) .	Very large, unknown .	98·6	0·55	0·3	0·55	...	
Panchet Hill . .	Large but limited .	45·05	11·53	0·28 (Fe_2O_3)	39·28 (insol.)	3·6	Ferrous carbonate } Upper bed
						0·07	Phosphoric acid } Upper bed
	Ditto . .	63·40	14·41	0·62 (Fe_2O_3)	19·28 (insol.)	4·15	Ferrous carbonate } Lower bed.
						0·12	Phosphoric acid } Lower bed.
Hanspathar . .	Ditto . .	83·43	0·78	...	16·18 (insol.)	0·68	Ferrous carbonate. } Lower bed.
						0·02	Phosphoric acid. } Lower bed.
Dalli, Drug, C. P. .	Very large . .	83·5	2·0	0·9	13·6	...	
Kandara, Chanda, C. P.	Unknown . .	94·5 to 96·8		3·0 to 1·2	2 to 2·5	traces of P.	

4. Modifying Metals.

Manganese.—Manganese is added to steel in the form of alloys of iron known as *Spiegeleisen* (20 to 30 per cent. Mn.) made from low grade ores, and *Ferro-manganese* (70 to 80 per cent. Mn.) requiring high grade ores. The average Indian production of manganese ore, 600,000 tons per annum, is roughly half of the annual world's output. It is estimated that 90 per cent. of the world's output of manganese ore is consumed in the preparation of spiegeleisen and ' ferro ' for the steel industry. Of the Indian production perhaps a twentieth part is at most utilized in the domestic steel industry. From these remarks it would appear that the demands of the Indian steel makers for manganese ore could be met and almost forgotten by the producers of manganese ore in India.

Silicon.—There should be no difficulty in obtaining supplies of quartz for the preparation of ferro-silicon. The quality of the raw material should have approximately the following composition : silica 98 per cent., lime and magnesia each not to exceed 2 per cent., phosphorus and arsenic to be *nil*. Iron oxide is not considered as an impurity. The quartz rock now being used at Kumardhabi for making silica bricks is of this quality.

5. Refractory Materials.

Chromite.—Chromite or chromium ore is being worked in India in the vicinity of the Zhob and Pishen valleys in Baluchistan; in the Kadakola and other districts of Mysore State; and near Chaibassa in Singhbhum (Bihar and Orissa). The average run of chromite used for refractory purposes in the manufacture of chromite (or so-called chrome) bricks carries from 38 to 45 per cent. of chromic oxide. Much of the Indian material is of higher grade (over 52 per cent. $Cr_2 O_3$). So far as I know Chrome bricks are not now being made in India although the Tata Iron and Steel Company are said to have made some during past years. No details are available showing the imports of chrome bricks but it is known that these bricks are used as a neutral lining in the basic steel furnaces at Jamshedpur. There are no details regarding the reserves of chromite in India and practically all the production is being exported.

Fire-clays.—The ceramic works of Raniganj, Kumardhubi, and Jabalpur are well known, but the deposits and beds of fire-clays throughout the country have not been investigated in a comprehensive manner. It is therefore impossible to give any correct idea of the quantities and qualities of the various kinds of clays which constitute fire-clays. The demand for Indian-made fire-clays in the iron and steel industry is small so that there has been no incentive towards exploitation. It is known that very large quantities of good quality material are available but the preference for

well-known brands of British fire-bricks persists to such an extent that on an average 3 million fire-bricks valued at Rs. 9 lakhs are imported annually. It is thus evident that there is scope for development and the Indian manufacturer appears to have a fair field for a satisfactory fire-brick.

Gannister.—The name truly applies to a silica refractory with a bonding material of fire-clay. Similarly Dinas bricks refer to silica bricks with lime as a binder. Both types therefore fall under the category of Silica discussed below.

Magnesite.—The Chalk Hills of the Salem district (Madras) contain the most valuable Indian deposits of magnesite. There are other occurrences, *i.e.*, those of Mysore, Baluchistan, Rajputana and elsewhere which have also been worked. Practically all the Indian production of magnesite over 19,000 tons (valued at Rs. 2,40,000) in 1922, was exported. The reserves of this material in the Salem district alone are considered as being almost unlimited. The United States are said to consume over 200,000 tons of magnesite annually for refractory purposes. It makes a basic lining in steel furnaces treating phosphoric pig iron.

Silica.—The manufacture of excellent silica bricks is one of the features of the output of the Kumardhubi fire-clay and Silica works. The raw material they use is a beautiful saccharoidal quartzite obtained from the Kharakpur Hills of Monghyr. Material of a similar nature is reported to occur in Rajgir Hills near Gaya. The numerous occurrences of clean quartz or quartzite of Naini near Allahabad and elsewhere which have been found suitable for the manufacture of glass are equally suitable for the preparation of the highest quality silica bricks. Unfortunately this massive material has to be crushed and sieved but by so doing certain advantages are gained; the graded products are available for different purposes.

The supplies of quartz, quartzite and quartz sands of good quality within reasonable distance of the Damuda coalfields are very large. The specifications of quartzite suitable for the manufacture of silica bricks are upwards of 98 per cent. silica, less than 2 per cent. ferric oxide, and less than 0·5 per cent. alkalies. These requirements should easily be fulfilled by the materials available in almost every province in India, and in quantities so large that no fear need be entertained as to supplies for the future.

From all that has been said with regard to the domestic resources of refractory materials it may be inferred that India is well supplied in these substances. The reserves are enough to meet almost any conceivable domestic demand. At the present time these materials are either being exported or are being developed on a negligible scale. Much remains to be done to encourage the exploitation of these materials.

INDIAN MINERAL PRODUCTION,

IN LONG TONS (2,240 LBS.)

Year.	Iron Ore.	Coal.	Manganese Ore.	Wolfram.	Chromite.	Magnesite.	Tin Ore(*a*).	Zinc Ore(*b*).
1911	366,190	12,715,534	670,290	1,308	3,804	3,290	97	...
1912	580,224	14,706,339	633,080	1,671	2,830	15,379	175	...
1913	370,845	16,208,009	815,047	1,688	5,676	14,086	171	...
1914	441,574	16,464,263	682,898	2,244	5,888	1,680	214	...
1915	390,339	17,103,932	450,416	2,457	3,767	7,450	289	...
1916	411,809	17,254,309	645,204	3,692	20,159	17,640	465	...
1917	413,356	18,212,918	590,813	4,542	27,061	18,202	666	...
1918	492,669	20,722,493	517,953	4,431	57,769	5,853	780	...
1919	563,750	22,628,037	537,995	3,525	36,439	17,126	1,569	...
1920	558,005	17,962,214	736,439	2,346	26,801	14,346	2,118(*c*)	750
1921	942,084	19,302,947	679,286	898	34,762	20,017	1,702	4,000
1922	625,274	19,010,986	474,401	943	22,777	19,273	1,875	318,061
1923	...	...	...	...	...	...	...	...

(*a*) Block Tin output not included. (*b*) Export quantities only. (*c*) Excludes 1,223 tons of low grade ore.

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Second Report.

CHAPTER I.

Introductory.

Introductory.

In paragraph 3 of our First Report to the Government of India we indicated that our recommendations regarding—

(*a*) The engineering industry,
(*b*) The subsidiary industries, and
(*c*) The railway wagon and locomotive industries

would be submitted later. In accordance with that undertaking we now submit our Second Report. In this Report we shall submit our recommendations regarding the following industries:—

(*i*) Engineering
(*ii*) Wagon building.
(*iii*) Tinplate.
(*iv*) Wire and Wire nails.
(*v*) Agricultural Implements.

We have also examined specially the circumstances affecting the construction in India of railway locomotives, the production of steel castings and the manufacture of enamelled ware. But we have no proposals to make at present for the grant of protection to these industries.

2. We have attached to this Report the following annexures:—

Annexures.

Annexure A.—A revised draft of those portions of the Tariff Schedule affected by our recommendations both in this Report and in the First Report. The changes made are explained in a note attached to the revised schedule.

Annexure B.—A Note examining the burden on the consumer which our proposals entail and explaining their probable effect on the Customs Revenue. This note has been prepared on the lines indicated in paragraph 141 of our First Report. The object in view has been to arrive at a maximum estimate of the burden on the consumer, and a conservative estimate of the increase in the Customs Revenue. Exact calculations are impossible on the materials available, and conjecture necessarily plays a large part. But we believe the results arrived at furnish a reasonably accurate forecast of the probable effect of our proposals.

CHAPTER II.

The Engineering Industry.

Explanation of the term "Engineering."

3. We have used the term "engineering" to cover the operations of a number of firms who manufacture a large variety of articles of iron and steel and to a smaller extent other metals. But it is only in so far as steel is the raw material employed that the finished products come within the scope of our enquiry. In a broad sense it might be held that the manufacture of steel is completed when the impurities in the pig iron have been removed in the steel furnaces, and that all subsequent processes, by which the raw steel is adapted for the uses to which it is ultimately to be put, are covered by the term "engineering." We do not, however, use the word in so wide a sense. The rolling of the steel ingots into convenient shapes and sizes is almost invariably carried out in the same works in which the pig iron is converted into steel. This is in fact done at Jamshedpur and we have dealt with the subject in our First Report. On the other hand, where the raw steel is finished by forging and not by rolling, it is for our purposes an engineering process, though not a very important one in India at present. The grounds for the distinction are practical and not theoretical, and consist mainly in this that steel is rolled by the firm which makes it but forged by other firms. Apart from forging the term "engineering" may be held to cover all processes of fabrication such as bending, machining, drilling, rivetting, etc., by which rolled steel is adapted for its final purpose. Where, however, firms have specialised in the manufacture of one particular article, or of a particular class of articles, and have submitted representations to us, we have dealt with them separately. Here again the distinction is purely a matter of practical convenience. The manufacture of wagons, for example, is an engineering process and, until very recently, no private firm in India had specialised in this direction. But the production of railway wagons in India raises issues of a special kind and one firm (The Indian Standard Wagon Company) has now been established which does not undertake other kinds of work. This branch of the subject cannot conveniently be treated under the head "engineering."

Main branches of Engineering Work.

4. The industry, as has already been said, covers a wide variety of products from the manufacture of small bolts and nuts to the construction of the largest railway bridges. No exhaustive enumeration is possible, but for practical purposes, the products with which we are concerned fall under the following heads:—

(1) Bridges and girder work.

(2) Buildings, stagings, trestles, jetties, etc.

(3) Tanks for oil and water.

(4) Well curbs.

(5) Chimneys.

(6) Certain vehicles, *viz.*, colliery tubs and tipping wagons.

(7) River steamers, tugs, flats, barges, boats and pontoons.

(8) Certain kinds of machinery.

(9) Miscellaneous articles such as switches and crossings, dog spikes and tie bars.

For the most part the steel which is used for the manufacture of these articles consists of the rolled sections which are, or will be, produced at Jamshedpur, including plates, structural sections such as beams, angles and channels and—to a lesser extent—bars and sheets. Essentially they fall under the head of fabricated steel.

Proposals of the Indian Engineering Association.

5. The views of the engineering firms were placed before us in a written representation by the Indian Engineering Association of which most of them are members. It was stated:—

"(*a*) That if the Tariff Board find that the steel-making industry requires protection, such protection should take the form of bounties rather than of import duties;

"(*b*) That the engineering industries should preferably be encouraged and protected by guaranteed Government orders at competitive Indian prices rather than by import duties or by bounties; but—

"(*c*) That if State aid in this form cannot be given, then the engineering industries should be protected by import duties, or by bounties, to precisely the same extent as the steel-making industry is protected."

For the reasons given in our First Report we have recommended that protective duties should be placed on most forms of rolled steel produced in India, and except in the case of rails we were unable to propose the grant of bounties. Nor can we recommend the method of fostering the engineering industry which the Association prefer. The placing of orders for Government work by tender in India only must, in so far as it attains its object, result in the payment of higher prices, and the extra payments thus made are bounties in everything but name. Under this system, moreover, the greater part of the assistance given would be at the expense of the Railways, and since the Company-managed Railways are not subject to the ordinary rules in such matters, this would mean the State Railways. Finally, the practical difficulties in the way of guaranteeing orders every year for a certain quantity of fabricated steel are great, if not insuperable. For these reasons we do not think that a system of guaranteed Government orders offers any real solution of the problem.

Compensating protection and substantive protection.

6. We have then to deal with the question on the basis that the cost of steel—the most important raw material of the engineering industry—will be raised by the imposition of protective duties, and in these circumstances such assistance as the engineering industry requires must be given in the same form. To work out any system of bounties for the varied products of the industry would in any case be extremely difficult, and is, for financial reasons, at present impracticable. The Association proposed that, failing the alternatives they preferred, the engineering industries should be protected " to precisely the same extent as the steel industry is protected." This phrase, however, is ambiguous, and here there is an important point to be cleared up. The additional duties on unfabricated steel must directly raise the costs of the engineering firms by a certain amount, and it would be possible, within certain limits, to determine by investigation what these amounts would be in the case of each product. If the import duties on fabricated steel were raised by precisely these amounts, the protection given would be what is sometimes called " compensating " protection. The engineering firms would then be no worse off than they are at present as regards meeting foreign competition, but they would be no better off. If, however, the Association meant, as they probably did mean, that the import duties on fabricated steel should be at approximately the same rates *ad valorem* as the duties on unfabricated steel, their proposal involves the grant of substantive protection to the engineering industry apart from the cost of its raw materials. It is clear from the evidence we have taken that compensating protection is necessary in the case of most of the engineering products, and the main question is whether something more is required, and, if so, what the amount should be. This question must, we think, be handled on broad lines.

The fabrication of steel—an essential part of manufacture.

7. We pointed out in paragraph 120 of our First Report that the manufacture of raw steel and its fabrication were inseparably connected and must stand or fall together, and that the market for the sale of the steel made at Jamshedpur depended on the existence of the engineering industry. This aspect of the case is of first class importance. The engineering firms have been doing valuable work for the country for many years, but so long as they had to import their steel from abroad, they could not take root deeply and had no special claim to assistance or encouragement from the State. But the position is entirely altered if once it is decided that the manufacture of steel in India should be fostered. Fabrication is one of the processes to which the Indian raw materials must be subjected before they can be used, and it is therefore an essential part of the manufacture of steel. The encouragement of engineering work in India provides an indirect, but immediate, stimulus to the production of raw steel, and, since economical production depends on a high output, tends eventually to lower the

cost of production. It is from this point of view that we have approached the question.

The Engineering industry suited to Indian conditions.

8. It is because the fabrication of steel is not separable from its manufacture in the narrow sense that we have not thought it necessary to discuss the question whether it fulfils the conditions laid down by the Fiscal Commission. What we have said in our First Report on that subject really covers the ground. It will suffice to point out that the industry has maintained itself in India for many years (some of the firms are more than a hundred years old) in spite of the disadvantage of having to import most of its raw materials from abroad. The Association numbers more than forty firms amongst its members, and Mr. Cameron, its Chairman, when giving oral evidence estimated that the capital invested was about Rs. 12 crores (£8 million sterling). There are also smaller firms which are not members of the Association, and the total number of men employed in all classes of engineering works is about 75,000. It is in this industry also that Indians can most readily obtain the technical training which is indispensable to the industrial development of the country. In every respect it seems suited to Indian conditions, and the need for protection is purely temporary.

Evidence as to production costs somewhat scanty.

9. We have not succeeded in obtaining so much information as we desired regarding the cost of production of fabricated steel in this country. For this there is more than one reason. The Tata Iron and Steel Company, being the only manufacturer of rolled steel in India, could afford to make public all the facts. The engineering firms, on the other hand, have many competitors in India and are naturally reluctant to disclose in public information which might be useful to their rivals. The immense variety of products which a single firm may turn out gives rise to further difficulties. The products of fabrication are not standardised, and it is impossible, for example, to say what the cost of bridgework is per ton. Within limits, every bridge is a special case and only average figures are possible. Again, the accounts of a firm may be kept in a form which does not readily permit the extraction of the kind of detail which, for our purposes, was desirable, and occasionally there may have been a tendency to overstate costs. For all these reasons we cannot attempt to examine the cost of production in the engineering industry in detail as was possible in the case of the Tata Iron and Steel Company. Such figures as we have been able to obtain serve rather as illustrations of the argument than as its foundation.

Classification of Engineering products.

10. In paragraph 4 we enumerated the principal products of the engineering industry with which we had to deal. Of these the last three (7) Steamers, Barges, etc., (8) Machinery and (9) Miscellane-

ous can best be taken separately. The first six fall naturally into two groups:—

I (1) Bridges and (2) Buildings where the steel used consists principally of structural shapes, such as beams, angles, channels, and

II (3) Tanks, (4) Well curbs, (5) Chimneys and (6) Coal tubs and Tipping Wagons, where steel plates are an important, or even the principal, raw material.

Bridgework and Buildings.

11. The evidence we have received makes it clear that it is in the case of bridgework and buildings that foreign competition is keenest, and Indian firms find it most difficult to hold their own. Nearly all the specific instances of undercutting from abroad which were given were for bridgework, but witnesses also mentioned the competition in buildings, and since there is no appreciable difference in the kind of material used or the work done, the two cases are not distinguishable. Three instances of the price at which fabricated structural steel is entering India may be quoted. Messrs. Richardson and Cruddas of Bombay mentioned a case in which fabricated bridgework was imported into this country in June 1922 at a price of Rs. 230 per ton c.i.f. Bombay. If Rs. 10 be added for landing and wharfage, the landed price is Rs. 240 a ton without duty. Again Messrs. Burn and Company gave an instance in which bridgework was landed at a cost, including duty, of Rs. 286 per ton. Deducting the duty, the c.i.f. landed price in India works out at about Rs. 260. Finally, Messrs. Jessop and Company mentioned a case in which a tender for bridgework was accepted at Rs. 284 per ton landed, including duty. If the duty once more be deducted, the landed cost is Rs. 258 per ton. We think these three cases are sufficient to show that fabricated structural steel is being imported at an average price in the neighbourhood of Rs. 250 a ton. On that basis, the present *ad valorem* duty may be taken at Rs. 25 on the average.

Proposed duty on fabricated structural steel.

12. After examining the evidence as to foreign competition, we recommend that the duty on fabricated structural steel should be raised from 10 to 25 per cent. So long as the manufacture of raw steel in India is the monopoly of a single firm and all competition is from abroad, prices are likely to be raised by the full amount of any additional duty which may be imposed. But in the engineering industry the circumstances are quite different. There are many firms engaged in the same kind of work, and internal competition is likely to keep prices down. Thus, for example, Messrs. Richardson and Cruddas of Bombay informed us that, when tendering for the construction of mill buildings, they had to meet competition from the Calcutta engineering firms. There is also the possibility that, if the prices of fabricated steel rose beyond certain limits, it might be replaced for particular purposes by other Indian materials, such as timber,

cast iron, masonry or reinforced concrete. It is quite possible, therefore, that the price of fabricated steel will not increase to the full extent of the duty. We have taken this factor into account in proposing a higher rate of duty on fabricated steel than we have proposed for unfabricated structural shapes (Rs. 30 a ton, or a little more than 20 per cent.). We think that, in the existing circumstances, the proposal is justified by the need of making certain that the market for raw steel produced in India is fully secured. But in the case of bridgework and buildings, at any rate, we believe that the protection accorded to the fabricating industry is not more than sufficient to make up the difference between internal and imported prices.

Practical effect of the proposed duty of 25 per cent. on fabricated structural steel.

13. It may be useful to examine the question, so far as evidence permits, how the *ad valorem* duty would operate in the case of fabricated structural steel such as is being imported at Rs. 250 a ton. A number of firms at our request furnished us with figures giving the proportion of the cost of the raw steel to the total cost of the finished work. The percentages given vary, but for the kind of steel we are considering the average was about 60 per cent. The prices at which unfabricated structural shapes are likely to be imported without duty we have estimated in our First Report to be Rs. 145 a ton, but this must be raised by 10 per cent. to cover the present duty, and again by the same percentage to cover the wastage of material which occurs in the process of fabrication. The cost of the unfabricated steel is therefore Rs. 176 at present, and the cost of fabrication (40 per cent. of the total) is approximately Rs. 117, the total cost being Rs. 293 a ton. When the new duty of 25 per cent. is imposed, the calculation will be modified as follows:—

	Rs.
Cost of the unfabricated steel (1 1/10 tons) without duty	160
Add duty at Rs. 30 a ton	33
Total cost of unfabricated steel	193
Cost of fabrication	117
Total cost of fabricated steel per ton	310

We have estimated that imported fabricated steel is likely to enter India without duty at Rs. 250 a ton, and the 25 per cent. duty will raise the price to Rs. 312 a ton. Out of the duty of Rs. 62 a ton, Rs. 33 merely compensates for the duty on the unfabricated steel. The balance (Rs. 29) is the measure of the protection given to the fabricating industry.

Reasons for proposing *ad valorem* and not specific duty.

14. We should have preferred, if it had been possible, to recommend the adoption of a specific duty or duties for fabricated steel rather than an *ad valorem* duty. We have not been able, however, to obtain figures for a sufficient number of pro-

ducts. As we have already pointed out, fabricated steel cannot be standardised in the same way as unfabricated steel, and there are no market quotations from which the general level of prices can be readily ascertained. The cost of fabricated steel is necessarily determined by the amount and kind of fabrication which has to be done, and this may vary, not only between one class of product and another, but also between different products of the same class. Were we to propose the imposition of a specific duty it would necessarily be based on some average figure, and it would be difficult to forecast how it would work out in any particular case.

Fabricated steel in which steel plates are an important or the principal raw material.

15. We turn now to those classes of fabricated steel which we have grouped together on the ground that in their manufacture steel plates are an important, or even the principal, raw material. They are—

Tanks.
Well Curbs.
Chimneys.
Colliery Tubs and Tipping Wagons.

The first three are at present subject to a 10 per cent. duty *ad valorem*, but the coal tubs and the tipping wagons are classed as vehicles and are subject to a duty of 15 per cent. In the case of colliery tubs competition from abroad seems to be as keen as in the case of fabricated steel, but in the case of the other classes the evidence leads us to think that competition is less severe. We have considered whether there are sufficient grounds for discriminating between this class on the one hand, and bridgework and buildings on the other, and imposing a lower rate of duty on the former. On the whole, however, we do not think this is advisable. The Indian market for plates is a limited one and it is here that the Indian manufacturer of steel will have most difficulty in selling the unfabricated steel. For this reason it is important that, as far as possible, the fabrication of plates in India should be encouraged.

River Craft.

16. A considerable number of steamers, tugs, flats, barges, etc., are manufactured at present principally at Calcutta and in Rangoon. The evidence we have taken suggests that in this branch of manufacture the engineering firms have little to fear from foreign competition, and no serious complaints have been made. This may be due to the fact that the component parts of these vessels are bulky in proportion to their weight, and the freight payable on imported materials is therefore higher than in the case of ordinary structural steel. In effect, therefore, these products enjoy a certain degree of natural protection. We are not satisfied that there are sufficient reasons at present for raising the 10 per cent. *ad valorem* duty in the case of vessels of this kind. It is possible of course that, with the increased cost of unfabricated steel, prices may rise to a level

at which the foreign manufacturer would find it possible to compete. But there is no real evidence at present that the risk is great or imminent, and we think the danger we have referred to must be dealt with specially when it arises.

Machinery.

17. In paragraphs 131—136 of our First Report we have referred to the question of the manufacture of machinery in India and the possible consequences in this connection of the proposed duties on unfabricated steel. We do not propose to go into the matter again, and it will suffice to repeat that the manufacture of certain kinds of machinery will be affected, and that an early enquiry is desirable.

Miscellaneous articles.

18. The only articles in this class to which we have not referred are switches and crossings, spikes and tie bars. All of these are railway materials and are manufactured by some of the engineering firms. We propose that switches and crossings, which are substantially fabricated steel, should become subject to the same rate of duty—25 per cent.—as we have proposed for other fabricated steel. In the case of spikes and tie bars we propose the same specific duty—Rs. 40 a ton—as we have proposed for steel bars in our First Report.

Summary.

19. The proposals we have made in connection with the engineering industry may be summarised as follows:—

(1) 25 per cent. *ad valorem* duty on fabricated steel generally, but excluding (*a*) steamers, launches, barges, flats, boats and other vessels, and (*b*) all vehicles except colliery tubs and tipping wagons.

(2) 25 per cent. *ad valorem* on switches and crossings.

(3) A specific duty of Rs. 40 a ton on spikes and tie bars.

CHAPTER III.

The Wagon Building Industry.

Position of the industry.

20. We shall attempt in dealing with the wagon building industry to state what seem to us the most important facts that have to be taken into account. Wagons have been built in Calcutta by two engineering firms—Messrs. Jessop & Company and Messrs. Burn & Company—for some twenty years past, and we understand that wagons have also been built occasionally by a Karachi firm, Messrs. Herman & Mohatta, but until the establishment of the Standard Wagon Company three or four years ago, no firm had specialised in wagon building to the exclusion of all other kinds of work.

The case for the Indian Manufacturer.

21. The case for the Indian manufacturer was put before us by Messrs. Burn & Company (who are also the managing agents of the Standard Wagon Company) and by Messrs. Jessop & Company. In substance their contentions were as follows:—

(1) Before the war, although they seldom or never got large orders, they were able to make wagons at the same price as the Home manufacturer and still make some profit.

(2) The war was succeeded by a period of very high prices, but in October 1922 an abrupt and precipitous fall took place.

(3) The successful tender in the autumn of 1922 was equivalent to about Rs. 3,500 per wagon erected in India, including Customs duty, freight and all intermediate charges. The lowest Indian tender was above Rs. 5,000 a wagon.

(4) The successful tender meant a price for the British manufacturer at or below the pre-war price of imported wagons and barely covered the cost of materials.

(5) This very low tender was a deliberate attempt to kill the manufacture of wagons in India. This was due to the establishment of the Standard Wagon Company which was likely to prove a more formidable competitor than the Calcutta engineering firms.

(6) It is impossible for the British firms to build wagons at a lower cost than Rs. 5,000 and make a reasonable profit.

How far the case is established.

22. The conclusions at which we have arrived after a careful consideration of all the evidence we have taken are as follows:—

(1) It is quite true that, before the war, Indian firms received orders for wagons at the equivalent of the price of

imported wagons. We doubt, however, whether they would have been successful in obtaining orders for a large number of wagons in open competition with the British firms, except possibly in a year of unusually high prices such as 1913. Ordinarily the orders which came their way would be for small quantities for which the British tenders would usually be higher.

(2) The successful tender in 1922 was an extraordinarily low one, actually below the price paid for imported wagons in 1913 and only about £20 a wagon above the average pre-war price. In order to tender at this figure profits must have been cut to the bone, if not eliminated, at every stage of manufacture.

(3) There is reason to believe that the British manufacturer can in times of stress through his connections with, and control over, other firms obtain his raw materials at abnormally low rates. On the other hand the Indian manufacturer, so far as can be judged from the figures submitted to us, seems to find difficulty in purchasing imported materials at prices as low as might be expected.

(4) The Indian Standard Wagon Company furnished us with an estimate of the lowest cost at which they could afford to build. It was divided as follows:—

	Rs.
Materials	3,109
Cost above materials	1,577

The estimate of the cost above materials, which includes Rs. 325—being the estimate of erection in India of an imported wagon—seems to us to be a reasonable one, and there appears to be some ground for thinking that it did not compare unfavourably with the corresponding costs in the United Kingdom.

(5) We find no reason for believing that the low tender which was successful in 1922 was due to a desire to kill the wagon building industry in India. From the fact that several other tenders, very little above the successful tender, were received from British firms we infer that there was intense competition to secure the order.

(6) We are compelled to reject the theory that British firms cannot make a reasonable profit at a lower price than Rs. 5,000 a wagon. The supporters of this theory lay too much weight on the figures of one pre-war year, 1913, when prices were abnormally high, and make no allowance at all for improvements in wagon building methods during and since the war.

Decisive Considerations.

23. The main considerations which must influence the decision regarding wagon building in India appear to be as follows:—

(1) The wagon tenders from British firms received recently are somewhat higher than in 1922. The lowest tender

for the A-1 covered wagon is apparently Rs. 3,700 as against Rs. 3,500. We do not find, however, sufficient reason for thinking that for imported wagons of this type prices substantially higher than these will have to be paid for several years to come. Competition from the Continent of Europe is likely to become more intense.

(2) It does not seem likely that the Indian manufacturer will be able to tender at a lower figure than Rs. 4,400 for covered wagons until he has an assurance of continuous orders and for fairly large numbers of wagons, so that he can secure the economy which comes from repetition work.

(3) If wagon building is to be encouraged in India it is important that the orders should at the outset be given for as few types as possible.

(4) The Indian manufacturer may be able to get fairly close to the British manufacturer's price when the tenders are for one hundred or two hundred wagons only. But small orders of this kind do little in themselves to encourage wagon building in India.

(5) We have not overlooked the fact that tenders were received this year from a Karachi firm (Messrs. Herman and Mohatta) at prices which in some cases were lower than the British tenders. We find it difficult to understand how the wagons could actually be built—as distinct from the assembling of imported parts on which some manufacture may have been done abroad—at Karachi for these prices except at a heavy loss. In any case, owing to the remoteness of Karachi from the Indian sources of raw materials, it seems certain that imported materials would be used exclusively for wagons built there. But the encouragement of wagon building in India necessarily means that the wagons should as far as possible be made of Indian materials. From this point of view Karachi is perhaps the most unsuitable site for wagon building in the whole of India.

(6) As far as we can judge there is no process of great inherent difficulty involved in wagon building. It is work which it should be quite possible to carry out in India at a reasonable cost.

(7) The building of wagons is a natural development of the growth of the steel industry in India. It is of great importance to the Indian steel manufacturer that this outlet for his steel should be open to him.

(8) The best index of the probable difference between the price of the Indian-built wagon and the price of the imported wagon is the difference between the lowest Indian tender and the lowest British tender in 1924 for the A-1 covered

wagon. The number for which tenders were called for was 1,500, whereas the numbers of other types asked for were much lower. It is for this reason that the difference between the lowest Indian tender and the lowest British tender is less in the case of some of the other types than in the case of the A-1.

(9) The proposals we have made for the imposition of higher duties on certain kinds of steel will raise the cost of the materials in an A-1 wagon by approximately Rs. 120.

Bounty recommended.

24. Our proposals have been framed on the basis of the considerations outlined in the last paragraph. It seems to us clear that wagon building cannot be effectively developed in India except at some cost to the State. We fully recognized the desirability of doing as little as possible to raise Railway costs, and we do not think that the imposition of a protective duty on imported wagons would be a suitable method of developing the industry, at any rate at this stage. It is essential that the Indian manufacturer should have some assurance of continuity of orders, and, as his capacity for carrying out work will increase as time goes on, that the numbers ordered in India should gradually rise. On the other hand, it is to be expected that as experience is gained and the output goes up the cost of production will fall. We have endeavoured in our proposals to provide for both points.

The proposed scale of bounties.

25. We recommend that bounties should be granted on the manufacture of wagons in India in accordance with the following scale:—

	Number of wagons on which the bounty will be payable.	Amount of bounty per wagon.	Cost of the bounty.
		Rs.	Rs. lakhs
First year . . .	800	850	6·80
Second year . . .	1,000	700	7·00
Third year . . .	1,200	580	6·96
Fourth year . . .	1,400	500	7·00
Fifth year . . .	1,600	440	7·04

It will be seen that the annual cost to the State is limited to Rs. 7 lakhs, that the number of wagons on which the bounty is payable rises from 800 to 1,600, while simultaneously the bounty per wagon drops from Rs. 850 to Rs. 440. The figure of Rs. 850—the bounty payable in the first year—is based on the difference between the lowest Indian tender and the lowest British tender for the A-1 covered wagon in 1924, *plus* Rs. 120 which is approxi-

mately the additional cost of the raw materials occasioned by the protective duties we have proposed on steel. 800 wagons is, we think, a reasonable limit to the number of wagons on which the bounty would be payable in the first year.

26. Three minor points may be noticed—

Conditions governing the payment of bounties.

(1) We think it should be a condition attached to the payment of the bounty that as far as possible Indian materials should be used in construction.

(2) The Railway Board should, when calling for tenders annually, announce on how many wagons of each type the bounty will be payable. It is desirable, if possible, that at the outset the wagons should all be of one type, or at any rate of as few types as possible. Unless the number of each type is announced beforehand, there might be difficulty in deciding in what proportions the orders should be divided when one firm had put in the lowest tender for one type and another for another type.

(3) The Indian firms would tender subject to the bounty within the limits fixed. If, for example, in the first year the bounty was payable on 800 wagons of the A-1 type and the lowest foreign tender was Rs. 3,800, the order would be given to the lowest Indian tender provided the price was not higher than Rs. 4,650. Subject to the bounty, therefore, the Indian manufacturer will compete against the foreign manufacturer.

CHAPTER IV.

Tinplate.

Tinplate.

27. Tinplate consists of thin sheets of steel coated with tin. It is essentially a steel product, the total weight of the tin used being less than one-fiftieth of the weight of the steel. Its most important use is for the manufacture of the tins in which kerosene oil and petrol are sold, and it is also used for cigarette tins, biscuit tins, and generally for all tinned food receptacles. The home of the industry is in South Wales which is still the great centre of manufacture in the United Kingdom. The only other country in which the industry has become fairly established on a large scale is the United States of America where its development was the direct result of heavy protective duties imposed in 1890. Even there, however, success was only attained by the importation of a large number of skilled workmen from Wales, and to this day, we understand, a large proportion of the tinplate workers in America are of Welsh birth or Welsh descent.

The Tinplate Company.

28. The project for the manufacture of tinplate in India originated during the war, when the oil companies found great difficulties in obtaining the supplies they required. Negotiations between the Burma Oil Company and the Tata Iron and Steel Company on the subject commenced in 1917, the estimates for the buildings and machinery were prepared in 1919, and a private Company was registered in 1920. The share capital amounts to Rs. 75 lakhs, of which approximately two-thirds are held by the Oil Company and one-third by the Iron and Steel Company. It soon became apparent, however, that the capital raised was insufficient and that the estimated cost would be greatly exceeded. We were informed in the course of the oral evidence that the total cost of the works when completed would be between Rs. 150 lakhs and Rs. 160 lakhs or more than double the original estimate which was apparently about Rs. 65 lakhs. Of the excess of over Rs. 90 lakhs the Tinplate Company ascribe Rs. 22·79 lakhs to the unfavourable exchange at the time the purchases were made, and Rs. 68·47 lakhs to higher prices and alterations in the design to render the works more suitable to Indian conditions. The additional capital required was raised by the issue of 10 per cent. debentures, all of which were taken up by the Burma Oil Company. The total amount of debentures authorized is Rs. 125 lakhs. The Company informed us confidentially in September of the amount actually issued up to that date, but as they are unwilling to make the figure public, we can make no use of it.

Progress of manufacture at the Tinplate Company's works.

29. The manufacture of tinplate at the Company's works began early in 1923, and when we visited the works in August, two out of the six mills were working. The third mill was expected to start in September and the fourth soon afterwards. The fifth and sixth mills were not expected to begin working until the cold weather of 1924-25. In fact, however, progress has been more rapid than was anticipated. All six mills had been put in operation by January 1924, and in the coming year (April 1924 to March 1925) the Company expect that they will approach, if they do not attain, the full output of which the plant is capable. These results are very satisfactory and reflect credit on the management. The Company employ between 80 and 90 covenanted men imported from Wales, and at the start all the work on the first two mills was done by them. The fact that within a year the whole of the six mills have been started with little or no increase in the covenanted staff shows that the Indian labourers have been rapidly trained to perform the less responsible and exacting duties on the mills. A number of years must probably elapse before the imported labour can be entirely dispensed with, but the success already attained justifies the expectation that a gradual reduction in the numbers will be possible.

Natural advantages and prospects of the Tinplate industry.

30. The natural advantages which the Company enjoys for the manufacture of tinplate are those which hold good in the steel industry generally. Tin has to be imported, but in this respect India is not worse off than the United Kingdom. The annual consumption of tinplate in India is about 50,000 tons with a tendency to increase, and, the Company's estimated output being 28,000 tons, it is clear that the market is sufficient. The principal grounds on which protection has been asked for fall under the following heads:—

(1) The necessity, in order to carry on work during the hot-weather months, of providing loftier and more expensive buildings and a more elaborate equipment than is required in Europe, or perhaps even in America, and the higher capitalization which these arrangements involve.

(2) The necessity for some years of employing a large number of imported workmen who draw much higher wages than they would do in their native country and are also granted certain allowances.

These are both real disadvantages under which the industry suffers at present, and the first is in the main a permanent handicap. The men on the rolling mills have to work under very trying conditions, and unless special arrangements were made, it is unlikely that work could continue during the hot weather without interruptions of a week or more at a time. The buildings are lofty and spacious, the platforms in front of the furnaces are water-cooled, and adequate arrangements have been made both for introducing cool air and for removing heated air. The second disadvantage (*i.e.*; the

high proportion of imported workmen) must continue for some time but should gradually diminish and eventually disappear. The process is likely to be slower than in the manufacture of steel, for American experience seems to show that the skill and experience of the Welsh tinplate workers still counts for a great deal, even when years have elapsed since the firm establishment of the industry.

Prospects that protection for Tinplate will eventually become unnecessary.

31. It would be premature to express a confident opinion, when the manufacture has been carried on for only one year, as to the eventual ability of the industry to dispense with protection altogether, but the success hitherto attained is sufficient to justify the hope that it will do so. It is satisfactory that tinplate of good quality was produced almost from the start, that six mills are now operating with practically the same covenanted staff as were employed on two mills a year ago and that work was carried on practically continuously throughout the hot weather. In one or two years' time it should be possible to form a definite opinion on the subject, but meanwhile the prospects are sufficiently favourable to warrant some assistance from the State.

The Company's claim to Protection.

32. In the evidence given on behalf of the Company it was suggested that protection at the rate of 45 per cent. was required. The figures for the cost of production submitted by them do not, however, establish the necessity of a rate as high as this. Tinplate is commonly sold by the box, which weighs 108 lbs. or a little less than one cwt. In September last the Company supplied us with three estimates of their costs (based partly on a few months' actual working) which may be summarised as follows:—

	Cost per box. Rs.
2 Mills working	30·88
4 Mills working	27·11
6 Mills working	25·10

The price of imported tinplate in 1923 was about Rs. 20 excluding the duty, and a 45 per cent. duty would raise the price to Rs. 29. Even with only 4 mills working, a somewhat smaller duty would have sufficed. In January, however, the Company informed us that while for certain reasons the cost of production in 1923 had been Rs. 34·84 per box, somewhat higher than was expected, they confidently anticipated that the average cost for 1924 would not be more than Rs. 25·10 and from 1925 onwards might be lower. It is on this basis that the application for protection must be considered and it is important to make it clear exactly what is included in the cost of production.

The Company's contracts with the Burma Oil Company.

33. The Tinplate Company has made two important contracts each of them for a period of 25 years. The first is with the Burma Oil Company for the sale of the tinplate it produces. Under this contract the Oil Company is entitled to take

the whole output of the Tinplate Company if of satisfactory quality. The latter Company expect that about 21,000 tons will actually be required and that about 7,000 tons will be available for sale to the public generally. The price to be paid for the tinplate under the contract is the same price as would be paid for imported tinplate, including freight, insurance, customs duty and landing charges.

The contract with the Tata Iron and Steel Company.

34. The second contract is with the Tata Iron and Steel Company for the purchase of the steel bars from which the tinplate is made. Under it the Iron and Steel Company undertake to supply annually 35,000 tons of sheet bars, and the arrangements as to the price to be paid are somewhat intricate. In the first instance, the Iron and Steel Company receive, as a provisional price, the price, " free on rail " Swansea, of sheet bar for tinplate. At the end of the year a final adjustment is made. If the average cost of production exceeds the average price of imported tinplate the Iron and Steel Company makes good half the loss to the Tinplate Company. Conversely, if the cost of production is less than the imported price, the Iron and Steel Company receives from the Tinplate Company half the profit. The contract provides what is to be taken into account in the cost of production for the purpose and in particular it includes—

(*a*) An allowance for depreciation calculated at rates which are laid down,

(*b*) Interest at 10 per cent. on the Tinplate Company's debentures, and

(*c*) Interest at 6 per cent. on the Tinplate Company's share capital.

Depreciation, of course, is always part of the cost of production, and interest on the debentures in so far as they represent working capital is also a fair charge. But interest on share capital or on debentures raised to meet fixed capital expenditure is on a different footing, and would not ordinarily be treated as part of the cost of production.

Prices likely to be received by the Tata Iron and Steel Company for Sheet Bars under the contract.

35. It is hardly possible to explain how the contract operates without taking concrete figures and this has been done in Statement I at the end of this Chapter. The statement shows the cost of production of 100 boxes of tinplate according to the Company's estimate for 6 mills working, and the price of sheet bars has been taken at the actual prices of 7th April and 4th August 1923 as supplied to us by the Tinplate Company. It also shows the price of imported tinplate on the same dates, the loss on production and the manner in which the loss is divided between the two Companies. The result to the Iron and Steel Company is a net price of Rs. 132 per ton of sheet bars on the figures of the 7th of April and a net price of Rs. 110 on the figures of the 4th of August. The net result to the Tinplate Company cannot be stated so simply.

Connection between the price of Sheet Bars and the price of imported Tinplate.

36. The statement shows that with prices as they were on the 7th April 1923, the price of imported tinplate was exactly equal to the cost of production after excluding all interest charges on fixed capital expenditure. With prices as they were on the 4th August of the same year, there was a loss of Rs. 108. It is to be noted, however, that the interest on working capital has been arrived at purely by rule of thumb from data supplied by the Company itself. Their estimate includes interest at 10 per cent. on debentures for Rs. 125 lakhs, and since the estimate for the fixed capital expenditure is Rs. 160 lakhs in all, and the share capital is only Rs. 75 lakhs, the remainder (Rs. 85 lakhs) must be made good from the debentures. The balance of the debentures (Rs. 40 lakhs) is available as working capital. But the Company have not informed us that so large a sum will actually be required, and the figure may prove to be excessive. The rate of interest is also unduly high and we know of no reason why the Tinplate Company should be compelled to borrow working capital at 10 per cent. when other Companies can borrow at 7½ per cent. Some reduction in the figure for interest on working capital should be possible, but as the figure taken is less than 3 per cent. of the cost of production the point is not of great importance.

Bearing of the contracts on protection for Tinplate.

37. The position created by the two contracts discussed in the preceding paragraphs is a somewhat unusual one. In effect the Tinplate Company is being heavily subsidised by the Tata Iron and Steel Company, although that Company is itself asking for protection for its own manufactures. It is true, of course, that the contract was made at a time when conditions were very different, and before it was known that the original estimate of the cost of the tinplate works would be greatly exceeded. Nevertheless, the contract seems to us to have been ill-advised from the point of view of the Iron and Steel Company, both because it is to continue for the very long term of 25 years, and still more because it makes the price which the Company is to receive for the steel it sells depend on the efficiency with which the purchaser carries on his business. The contract with the Burma Oil Company is also of importance on account of the provision which entitles that Company to take the whole of the Tinplate Company's output. We were at first inclined to the view that, in the very peculiar circumstances created by the two contracts, it was doubtful whether the grant of protection could be justified at all. On the whole, however, we do not think that the objections are decisive. The Burma Oil Company receives no concession in the matter of price but pays exactly what it would pay for imported tinplate, and we believe that it is not likely to exercise its right to take the whole of the Tinplate Company's output. In itself the establishment of the tinplate industry in India is clearly desirable, and we believe there are good chances of success. Some assistance seems to be necessary for the next two or three years, but we are clearly of opinion that it should be limited to the minimum which

will suffice to keep the Company going until it is in a position to stand alone.

Proposed duty on Tinplate.

38. Imported tinplate is at present subject to a duty of 10 per cent. on a tariff valuation of Rs. 400 a ton. We recommend that a specific duty of Rs. 60 a ton, equivalent to 15 per cent. be imposed. This will mean a duty of approximately Rs. 3 per box instead of the present duty of Rs. 2 per box. In statement II below the results to the Tinplate Company have been worked out on the same basis as in statement I. The final result is that, after meeting all ordinary overhead charges, a surplus remains of from Rs. 100 to Rs. 150 per hundred boxes, or from Re. 1 to Rs. 1-8 per box. As the outturn expected is 6,22,000 boxes annually, the total sum available is from Rs. 6¼ to Rs. 9½ lakhs. If the whole of the authorized debentures are actually required, interest at 10 per cent. would amount to Rs. 8·5 lakhs. The interest on the remaining Rs. 40 lakhs, assumed to be working capital, has already been provided for in the cost of production. We have not been informed, however, whether in fact the whole of the debenture capital is likely to be issued, and in any case allowance should be made for the fact that the plant was purchased at a time of very high prices.

Effect of the recommendations on the Tata Iron and Steel Company.

39. We recognize that the proposals we have made will not go far towards removing the loss which the Iron and Steel Company seem likely to incur on the supply of sheet bars to the Tinplate Company. We consider, however, that our proposals must be framed to suit the needs of the Tinplate industry itself and cannot be adapted to meet the very special circumstances created by the contract between the Iron and Steel Company and the Tinplate Company. Nothing short of a bounty from general revenues in the case of sheet bars would really remedy the situation that has arisen, but we do not consider that this is a case in which a mistake made by the Company can be rectified at the expense of the taxpayer. We may, however, point out that the Iron and Steel Company anticipate that when they attain their full production, they will be able to produce sheet bars in the sheet bar and billet mill at a cost excluding overhead of about Rs. 80 a ton. If they are successful in achieving this result, although the manufacture of sheet bars may not be very profitable, it is not likely to result in a heavy loss.

STATEMENT I.

Estimated cost of production of 100 boxes of tinplate in accordance with figures supplied by the Tinplate Company (see paragraph 35).

	Prices taken as at 7th April 1923.	Prices taken as at 4th August 1923.
	Rs.	Rs.
Provisional price for 6 tons of sheet bar	898	821
Works cost above metal	1,204	1,204
Total works costs	2,102	2,025
Depreciation	135	135
Interest on working Capital (10 per cent. on Rs. 40 lakhs).	64	64
TOTAL	2,301	2,224
Interest on debentures representing fixed capital (10 per cent. on Rs. 85 lakhs).	137	137
Interest at 6 per cent. on Rs. 75 lakhs share capital.	72	72
Total cost as provided for in the contract	2,510	2,433
Price of imported tinplate	2,300	2,116
Loss on the production of tinplate	210	317
Share of the loss to be borne by the Iron and Steel Company.	105	158·5
Net loss to the Tinplate Company	105	158·5

STATEMENT II.

Estimated cost of production of 100 boxes of tinplate after eliminating all interest charges on fixed capital expenditure (see paragraph 38).

	Prices taken as at 7th April.	Prices taken as at 4th August.
	Rs.	Rs.
Cost of production calculated in accordance with the contract.	2,510	2,433
Imported price including duty of Rs. 3 a box	2,400	2,216
Loss on production	110	217
Share of the loss to be borne by the Iron and Steel Company.	55	108·5
Cost of production excluding all interest charges on fixed capital expenditure.	2,301	2,224
Imported price including duty of Rs. 3 per box *plus* the amount payable by the Iron and Steel Company.	2,455	2,324·5
Surplus at the disposal of the Tinplate Company after meeting all ordinary overhead charges.	154	100·5

CHAPTER V.

Wire and Wire Nails.

Indian Steel Wire Products, Limited : its equipment.

40. We received an application from the Indian Steel Wire Products, Limited, for the grant of protection to the manufacture of wire and of wire nails. The Company's works are located at Jamshedpur and it has made contracts with the Tata Iron and Steel Company for the supply of the steel rods from which the wire is manufactured. The full capacity of the plant is about 9,000 tons a year, but its present output does not exceed 120 tons a month. The Company hopes eventually to manufacture barbed wire, stranded fencing wire and galvanised wire, but at present its operations are confined to the drawing of ordinary wire and the making of wire nails. The trade returns for the year 1922-23 show that the imports of wire of all kinds and wire nails from the British Empire were about 3,000 tons and from foreign countries about 16,500 tons. The British imports consist chiefly of special wire which the Company is not yet equipped to produce, and the competition which has to be faced comes chiefly from Germany and Belgium.

All-in cost of production per ton.

41. When we examined the representatives of the Company in September 1923, the results of only 4 months' working could be placed before us, so that the data on which the cost of production can be estimated are somewhat scanty. In addition, the present output is so small in proportion to the capacity of the plant that not only is the incidence of the overhead charges per ton very heavy, but the works costs also come out high. We have scrutinized the figures submitted by the Company carefully and the results may be summarised as follows:—

	Estimated cost of production on an output of 250 tons a month.
	Rs.
Metal costs	187
Works costs above metal . . .	65
Total works costs per ton .	252
Overhead charges	44
All-in cost per ton .	296

The output we have assumed—250 tons a month—is the full capacity of the plant working one shift a day. To calculate what the

costs are likely to be on a smaller output would not, we think, serve any useful purpose. Each item in the costs has been examined and we have not hesitated to reduce the Company's figures when they appeared unreasonably high.

Selling price with reasonable profit.

42. In order to determine what is a fair selling price for the Indian manufacturer it is necessary also to ascertain what is a fair allowance for the return on capital. The capital of the Company stands at a little over Rs. 21 lakhs. We do not consider it probable that capital can be raised in India, for the smaller industries such as wire, at a lower rate of interest than 10 per cent. and the total return on capital is therefore Rs. 2·16 lakhs. If this profit has to be earned on a production of 3,000 tons per annum, it amounts to Rs. 72 per ton. We do not consider, however, that a firm can reasonably expect to earn a full profit during the first two or three years of its existence or on an output equal to about a third of its full capacity. The total return on capital must, we think, be distributed over the full output of 9,000 tons a year and the incidence is then Rs. 24 per ton. The fair selling price is then as follows:—

	Per ton. Rs.
All-in cost of production	296
Return on capital	24
TOTAL .	320

Price of imported wire.

43. The evidence we have obtained from the Company, which is confirmed by other sources of information, leads us to the conclusion that imported wire, such as is manufactured by the Company, is likely to enter India at a price without duty of Rs. 260 a ton. It is on the difference between this figure and the fair selling price as determined in the last paragraph that our proposals are based.

Proposed amount of protection for Wire.

44. The various kinds of wire which at present are alike subject to a uniform *ad valorem* duty of 10 per cent. can be classified as follows:—

(1) Barbed wire and stranded fencing wire.

(2) Single strand plain or galvanised wire made of ordinary soft steel for telegraphs, light fences and other miscellaneous purposes.

(3) Special wire, either made of soft steel drawn to extremely fine wire, or made of harder steel, hardened and tempered for springs, umbrella fittings and other special purposes.

The Company are at present equipped to make only the kinds of wire falling in the second group. We recommend that barbed wire and stranded fencing wire should remain subject to the present duty

of ten per cent. *ad valorem* and that on all other wire a specific duty of Rs. 60 a ton should be imposed. This will be equivalent to a little less than 25 per cent. on wire such as the Company manufacture. The special kinds of wire vary considerably in value, but the great proportion of them fall within the limits of Rs. 500 and Rs. 800 a ton. On such wire the specific duty of Rs. 60 a ton would vary from 12 to 7 per cent. We have been constrained to put our proposals in this form owing to the great difficulty the Customs authorities would have in discriminating between the special and ordinary wires if they were subject to different rates of duty.

The same amount of protection for Wire Nails.

45. We have not examined separately the cost of production of wire nails and indeed no data for such an examination are available. These nails are manufactured from wire by means of simple automatic machines, several of which can be looked after by a single workman properly trained for the purpose, and the extra cost is not large. The price of imported wire nails is about the same as that of wire and is sometimes actually lower. The present duty is 10 per cent. on a tariff valuation of Rs. 280 a ton. We propose that the specific duty of Rs. 60 a ton should also be imposed on wire nails.

CHAPTER VI.

Agricultural Implements.

Manufacture of ploughs.

46. Two applications for protection for the manufacture of agricultural implements have reached us. One was submitted by the firm of Kirloskar Brothers, Limited, of Kirloskarwadi in the Satara District of the Bombay Presidency, who specialise in the manufacture of ploughs made partly of steel and partly of iron. The oral evidence which we took from a representative of the firm made it clear that at present the competition of imported ploughs is not serious and that, even when the duty on raw steel is increased to the extent we have proposed, there is no reason for apprehension that the firm will be unable to hold its own. We have therefore no recommendation to make in this matter.

The Agricultural Implements Company, Limited : nature of its difficulties.

47. The second application was received from the Agricultural Implements Company, Limited, whose works are at Jamshedpur. This firm obtains from the Tata Iron and Steel Company the steel which it requires at favourable rates. The principal articles manufactured at present are picks, *powrahs* or *kodalis* and hoes. The Company's works, which we visited in August last, are well laid out and equipped with modern and up-to-date machinery. The full capacity of the plant is about 4,000 tons of finished goods per annum, but the present production is only about 80 tons a month or less than a thousand tons a year. At this rate of output the incidence of the overhead charges is very high and the all-in cost per ton is Rs. 767 (excluding depreciation) whereas the wholesale selling price for goods of the kind manufactured by the Company is Rs. 710 per ton. When full production is reached, the all-in cost of production is expected to drop to Rs. 609 a ton excluding, or Rs. 666 including, depreciation. The profit remaining would be equivalent to a return of about 7 per cent. on the Company's share capital.

Need for temporary protection : its amount.

48. We are satisfied that the Company is efficiently managed and is likely to do well provided it can reach its full output. Protection is needed in this case not as a permanent measure, but as a temporary expedient to enable the Company to get a foothold in the Indian market and increase its production rapidly. Under the present tariff certain agricultural implements are admitted free of duty, but the articles produced by the Company do not fall under this category but are subject to the *ad valorem* duty of 15 per cent. applicable to hardware. The Company has asked that an additional duty of 20 per cent. be imposed, making 35 per cent. in all, but we do not think there are sufficient grounds for

protection to this extent. We recommend that the present *ad valorem* duty be raised to 25 per cent. on picks, *powrahs* or *kodalis* and hoes. We believe that this amount of protection will suffice to enable the Company to extend the scale of its operations, and in two or three years work up to its full capacity.

Difficulty of determining the burden on the consumer.

49. The Trade Returns do not classify implements of this kind separately and we have failed to obtain trustworthy statistics of consumption from other sources. We are unable, therefore, to estimate what the burden on the consumer is likely to be, or the probable effect on the Customs Revenue. Machine-made implements such as are produced by the Company are too expensive for the ordinary cultivator. The additional burden is likely to fall on Railways, Irrigation works, local bodies, mines and large plantations.

G. RAINY,
President.

P. P. GINWALA.

V. G. KALE.

G. C. F. RAMSDEN,
Secretary.

The 26th February 1924.

ANNEXURE A.

Proposed sections of the Tariff Schedule, embodying the Tariff Board's recommendations.

Serial No.	Names of Articles.	Per	Tariff Valuation.	Duty.
67	CONVEYANCES—			
	COAL-TUBS, tipping wagons and the like conveyances designed for use on light rail track if adapted for manipulation by manual labour and if made mainly of iron or steel; and component parts and accessories thereof.	...	Rs. A. *Ad valorem*	25 per cent.
	TRAMCARS, motor-omnibuses, motor-lorries, motor-vans, passenger lifts, carriages, carts, jinrikshas, bath-chairs, perambulators, trucks, wheel barrows, bicycles, tricycles, and all other sorts of conveyances not otherwise specified, and component parts and accessories thereof, except such parts and accessories of the motor vehicles above-mentioned as are also adapted for use as parts or accessories of motor cars, motor cycles or motor scooters (see No. 68).	...	,, ,,	15 ,, ,,
75	HARDWARE, IRONMONGERY AND TOOLS—			
	PICKS kodalies, powrahs, mamooties and hoes.	...	,, ,,	25 per cent.
	ALL other sorts not otherwise specified.	...	,, ,,	15 ,, ,,
	METALS, IRON OR STEEL.			
90	IRON—			
	ANGLE, channel and tee, not fabricated.	ton	200 0	10 ,, ,,
	Crown and superior qualities.			
	Other kinds	,,	Specific	20 Rs.
	,, ,, if galvanised, tinned or lead coated.	,,	200 0	10 per cent.
	ANGLE, channel and tee, fabricated	...	*Ad valorem*	15 ,, ,,
	BAR AND ROD—			
	Qualities superior to Grade A of the British Engineering Standard Association.	ton	350 0	10 ,, ,,
	Grade A of the British Engineering Standard Association and Crown quality and intermediate qualities—			
	Over ¼ inch in diameter or thickness.	,,	160 0	10 ,, ,,
	¼ inch and under in diameter or thickness.	,,	190 0	10 ,, ,,

Proposed sections of the Tariff Schedule, embodying the Tariff Board's recommendations—*contd.*

Serial No.	Names of Articles.	Per	Tariff Valuation.	Duty.
	METALS, IRON OR STEEL—*contd.*		Rs. A.	
	IRON—*contd.*			
	BAR AND ROD—*contd.*			
	Common	ton	Specific	35 Rs.
	,, if galvanised, tinned or lead coated.	,,	180 0	10 per cent.
	All other sorts	...	*Ad valorem*	10 ,, ,,
	PIG	ton	90 0	10 ,, ,,
	RICE Bowls	cwt.	25 0	10 ,, ,,
	SPIEGELEISEN, ferro-manganese, ferro-silicon and other ferro alloys.	...	*Ad valorem*	10 ,, ,,
	STEEL—			
91	ALLOY steel, all kinds	...	*Ad valorem*	10 ,, ,,
	ANGLE and tee if galvanised, tinned or lead coated.	ton	200 0	10 ,, ,,
	If fabricated	...	*Ad valorem.*	10 ,, ,,
	ANGLE and tee, all other sorts, and beam, channel, zed, trough-plate, piling and other structural sections, not fabricated.	...	Specific	30 Rs.
	If fabricated	...	*Ad valorem*	25 per cent.
	BAR AND ROD—			
	Swedish and similar qualities	ton	220 0	10 ,, ,,
	Planished, polished or coated with other metals.	,,	180 0	10 ,, ,,
	Common merchant and bar and rod designed for the reinforcing of concrete, all sizes.	,,	Specific	40 Rs.
	All sorts not otherwise specified	...	*Ad valorem*	10 per cent.
	CRUCIBLE, shear, blister and tub steel all kinds.	...	*Ad valorem*	10 ,, ,,
	EXPANDED metal	...	,, ,,	10 ,, ,,
	INGOTS, blooms and billets	...	,, ,,	10 ,, ,,
	RAILWAY TRACK MATERIAL—			
	Rails 30 lbs. and over per yard, and fishplates therefor.	ton	Specific	14 Rs.
	Rails under 30 lbs. per yard, and fishplates therefor.	,,	,,	40 ,,
	Bearing plates	...	*Ad valorem*	10 per cent.
	Spikes and tie-bars	ton	Specific	40 Rs.
	Sleepers and fastenings therefor and lever boxes.	...	*Ad valorem*	10 per cent.
	Switches, crossings and the like material not made of alloy steel.	...	,, ,,	25 ,, ,,
	SLABS, 1¼ inch thick or over	...	,, ,,	10 ,, ,,
	STEEL for springs and for cutting tools made by any process.	...	,, ,,	10 ,, ,,
	STRUCTURES fabricated partially or wholly, not otherwise specified, if made mainly or wholly of steel bars, sections, plates or sheets for the construction of buildings, bridges, tanks, well-curbs trestles, towers and similar structures or for parts thereof, but not including builders' hardware (see No. 75) or articles specified in Nos. 67, 87, 88 or 136.	...	*Ad valorem*	25 ,, ,,

Proposed sections of the Tariff Schedule, embodying the Tariff Board's recommendations—*contd.*

Serial No.	Names of Articles.	Per.	Tariff Valuation.	Duty.
	METALS, IRON OR STEEL—*contd.*		Rs. A.	
	STEEL—*contd.*			
	TIN plates and tinned sheets including tin taggers.	ton	Specific	60 Rs.
	Tin plate cuttings . . .	...	*Ad valorem*	15 per cent.
	TRAMWAY TRACK MATERIAL—			
	Rails, fishplates, tie bars, switches, crossings and the like materials of shapes and sizes specially adapted to tramway track.	...	,,	10 ,, ,,
	WIRE rope	...	,,	10 ,, ,,
92	IRON OR STEEL—			
	ANCHORS and cables . . .	...	,,	10 ,, ,,
	BOLTS and nuts including hook bolts and nuts for roofing.	...	,,	10 ,, ,,
	HOOPS AND STRIPS—			
	Hoops, Crown and superior qualities.	ton	250 0	10 ,, ,,
	,, other kinds . . .	,,	200 0	10 ,, ,,
	,, ,, ,, if galvanised tinned, planished, lead coated or aluminium coated.	,,	250 0	10 ,, ,,
	Strips, Crown and superior qualities.	,,	250 0	10 ,, ,,
	,, other kinds . . .	,,	200 0	10 ,, ,,
	,, ,, ,, if galvanised, tinned, planished, lead coated, or aluminium coated.	,,	250 0	10 ,, ,,
	NAILS, RIVETS AND WASHERS, all sorts—			
	Nails, wire or French . . .	cwt.	Specific	3 Rs.
	,, rose, deck, and flat-headed	,,	20 0	10 per cent.
	,, other kinds, including galvanised, tinned or lead coated and panel pins and tacks.	,,	33 0	10 ,, ,,
	Rivets, black	,,	14 0	10 ,, ,,
	,, other sorts . . .	,,	24 0	10 ,, ,,
	Washers, galvanised, nickel-plated, tinned or lead coated and dome-shaped, spring or locking washers.	...	*Ad valorem*	10 ,, ,,
	Washers, other sorts . . .	cwt.	19 0	10 ,, ,,
	PIPES and TUBES and fittings therefor, that is to say, bends, boots, elbows, tees, sockets, flanges, plugs, valves, cocks and the like.			
	If rivetted or otherwise built up of plates or sheets.	...	*Ad valorem*	25 ,, ,,
	All other kinds . . .	...	,,	10 ,, ,,
	PLATES not under ⅛ inch thick, including sheets ⅛ inch or over—			
	Boiler fire-box and special qualities, not fabricated.	ton	300 0	10 ,, ,,
	Ship, tank, bridge and common, not fabricated	,,	Specific	30 Rs.
	Cuttings all kinds . . .	,,	,,	25 ,,
	All kinds, fabricated . . .	...	*Ad valorem*	25 per cent.
	SHEETS under ⅛ inch thick—			
	Black, whether corrugated or flat	ton	Specific	30 Rs.
	Galvanised, whether corrugated or flat.	,,	,,	45 ,,

Proposed sections of the Tariff Schedule, embodying the Tariff Board's recommendations—*contd.*

Serial No.	Names of Articles.	Per	Tariff Valuation.	Duty.
			Rs. A.	
	METALS IRON OR STEEL—*concld.*			
	SHEETS, under ¼ inch thick—*contd.*			
	Cuttings of the above kinds of sheets.	...	*Ad valorem*	15 per cent.
	If annealed which have been either cold-rolled, smoothed (including planished), pickled or cleaned by acid or other material or process.	ton	200 0	10 ,, ,,
	Coated with metals other than tin or zinc of 26 gauge or thicker.	,,	320 0	10 ,, ,,
	Coated with metals other than tin or zinc thinner than 26 gauge.	,,	425 0	10 ,, ,,
	Other sorts, including cuttings not otherwise specified.	...	*Ad valorem*	10 ,, ,,
	SHEETS, all sorts, fabricated	...	,,	15 ,, ,,
	WIRE—			
	Barbed and stranded fencing	...	*Ad valorem*	10 ,, ,,
	Netting	...	,, ,,	15 ,, ,,
	All other kinds	ton	Specific	60 Rs.
	IRON OR STEEL, all other kinds not otherwise specified.	...	*Ad valorem*	15 per cent.
93	IRON OR STEEL CANS OR DRUMS—			
	When imported containing kerosene and motor spirit which is separately assessed to duty under No. 34, namely :—			
	Cans, tinned, of four gallons capacity.	can	0 5	15 ,, ,,
	Cans or drums, not tinned, of two gallons capacity—			
	(*a*) with faucet caps	can or drum	1 8	15 ,, ,,
	(*b*) ordinary	,,	0 6	15 ,, ,,
	Drums of four gallons capacity—			
	(*a*) with faucet caps	drum	2 3	15 ,, ,,
	(*b*) ordinary	,,	1 8	15 ,, ,,
	IRON OR STEEL CANS OR DRUMS, other sorts.	...	*Ad valorem*	15 ,, ,,
	RAILWAY PLANT AND ROLLING STOCK.			
101	RAILWAY MATERIALS FOR PERMANENT WAY AND ROLLING STOCK, NAMELY :—			
	(*a*) Rails 30 lbs. and over per yard and fishplates therefor.	ton	Specific	14 Rs.
	(*b*) Rails under 30 lbs. per yard and fishplates therefor.	,,	,,	40 ,,
	(*c*) Spikes and tie bars	,,	,,	40 ,,
	(*d*) Switches crossings and the like materials not made of alloy steel.	...	*Ad valorem*	25 per cent.

Proposed sections of the Tariff Schedule, embodying the Tariff Board's recommendations—*concld.*

Serial No.	Names of Articles.	Per.	Tariff Valuation.	Duty.
			Rs. A.	
	RAILWAY PLANT AND ROLLING STOCK—*concld.*			
101	RAILWAY MATERIALS FOR PERMANENT WAY AND ROLLING STOCK, NAMELY—*contd.*			
	(e) Sleepers and fastenings therefor, bearing-plates, fish-bolts and nuts, chairs, interlocking apparatus, brake-gear, couplings and springs, signals, turntables, weigh-bridges, carriages, wagons, traversers, trollies, trucks and component parts thereof; also the following articles when imported by, or under the orders of, a railway company, namely, cranes and water cranes.	...	*Ad valorem*	10 per cent.
	Provided that for the purpose of this entry "railway" means a line of railway subject to the provisions of the Indian Railways Act, 1890, and includes a railway constructed in a State in India and also such tramways as the Governor-General in Council may, by notification in the *Gazette of India*, specifically include therein:			
	Provided also that nothing shall be deemed to be dutiable hereunder which is dutiable under No. 87 or No. 88.			
102	COMPONENT PARTS OF RAILWAY MATERIALS, as defined in No. 101 (e), namely, such parts only as are essential for the working of railways and have been given for that purpose some special shape or quality which would not be essential for their use for any other purpose:	...	*Ad valorem*	10 ,, ,,
	Provided that articles which do not satisfy this condition shall also be deemed to be component parts of the railway material to which they belong, if they are essential to its operation and are imported with it in such quantities as may appear to the Collector of Customs to be reasonable.			

NOTES ON PROPOSED SECTIONS OF TARIFF SCHEDULE.

General Note:—Wherever tariff valuations are entered in the proposed schedule, they are those of the 1924 issue of the schedule.

67. CONVEYANCES—

This is in accordance with paragraph 19 of the Board's Second Report.

75. HARDWARE, ETC.—

This is in accordance with paragraph 48 of the Board's Second Report.

90. IRON—

Angles, etc.—These articles are brought together in view of their similarity in use, price and methods of manufacture. The duties on the common qualities are raised to prevent the substitution of steel sections by these articles.

Bar, etc.—The specific duty on common uncoated bars and rods is required to prevent the substitution of steel bars and rods by the cheaper forms of wrought iron. The duties on the other qualities remain unchanged. It has been made clear that all the duties will apply to rod as well as to bar.

Pig.—No change.

Rice Bowls.—No change.

Ferro alloys.—It is not clear how these are dealt with in the present schedule. It has now been definitely provided that they are not to pay more than 10 per cent. in present circumstances.

91. STEEL—

General.—It is more convenient that steel should be dealt with before " Iron or steel ".

Alloy steel.—See note on ferro-alloys above.

Angles, etc.—These structural shapes have been brought together for uniform protective treatment. The angles and tees coated with other metals remain unchanged.

Bar, etc.—The items which are at present subject to tariff valuation remain unchanged and are entered as at present. A specific duty of Rs. 40 is entered for common and re-inforcing bars. All other qualities remain at 10 per cent. *ad valorem* as at present and are grouped together.

Crucible, etc.—These do not compete with Indian manufactures and will continue to pay 10 per cent. duty.

Expanded Metal.—Owing to the breaking up of the present item " beams, etc.", under 91, this needs separate mention. No change.

Ingots, etc.—No change.

Railway, etc.—No change in bearing-plates, lever-boxes, sleepers and fastenings. The present duty on rails and fish-plates has been

converted into an equivalent specific duty for the medium and heavy articles. The same duty is put on light rails (which are rolled in bar mills) and fishplates as on bars, as no bounty will be paid on these. The duty on spikes and tie-bars, which can be (and are to a considerable extent at present) made of Indian steel bar is brought into line with the duty on bar. Switches, etc., can be, and are, made in India from Indian material and are treated as fabricated steel.

Slabs.—No change, except that a limit of thickness has been introduced.

Spring steel, etc.—No change is made in the treatment. The definition in the existing schedule is not sufficiently comprehensive.

Structures.—This has been drafted to cover the kinds of fabricated steel work which it is proposed to protect.

Tinplates.—The duty recommended is equivalent to 15 per cent. on the 1924 valuation.

Tramway Material.—These rails, etc., cannot be made in India and this item has been inserted in order to leave these articles at 10 per cent.

Wire rope.—No change. This is invariably made of steel.

92. IRON OR STEEL—

Anchors, etc.—No change.

Bolts, etc.—No change.

Hoops, etc.—No change.

Nails, etc.—No change except in wire or French nails.

Pipes, etc.—No change except for the separation for a protective duty of fabricated pipes.

Plates.—The duty on cuttings has been raised in consequence of the increase in the duty on ordinary plates. Special qualities of plates remain unchanged. Material $\frac{1}{8}$ inch thick is transferred to plates from the present classification as sheets. This is in accordance with a general trade practice and with manufacturing conditions in India.

Sheets.—The principle here has been that for the kind of sheets which will be made in India during 1924 the duty should be made specific and equal to 15 per cent. on the 1924 tariff valuations. The other sheets are to remain at their present valuations. The classification has to some extent been recast with this in view and also to bring it more in line with costs in the industry; *e.g.*, a black corrugated sheet does not cost as much as a galvanised. Nor does a flat galvanised sheet (up to 26 gauge) cost Rs. 20 per ton more than a corrugated. It is not necessary for protective purposes to maintain the present distinction between different thickness of galvanised sheets or of tinned sheets.

Wire.—Barbed and stranded fencing wire remain as at present. Netting also remains as at present but has been removed from No. 93. The other wires are to bear the specific duty shown.

All other kinds.—Have been removed to this number from No. 93.

93. CANS OR DRUMS—

No change has been made in this except those already indicated, which leave this number concerned with cans and drums only.

101 and 102. RAILWAY PLANT—

No. 101 has been modified to enable the same treatment to be provided for the items mentioned in (*a*), (*b*), (*c*) and (*d*) as in No. 91. Also, such articles as bridgework, water tanks and wire have been removed, since it is unnecessary to mention them here as well as in the Iron and Steel entries.

The only change in No. 102 has been to alter "No. 101", to "No. 101 (*e*)" to make it clear that the 10 per cent. duty on component parts will not apply to No. 101 (*a*), (*b*), (*c*) and (*d*).

ANNEXURE B.

Note on the proposals of the Tariff Board examining the burden on the consumer which they entail and explaining their probable effect on the Customs Revenue.

This Note has been prepared with the object of examining the burden on the consumer which the proposals of the Tariff Board will entail, and of ascertaining the probable effect on the Customs Revenue. The Board's proposals include both the imposition of protective duties and the grant of bounties, and it is necessary to show how far the extra revenue suffices to meet the expenditure involved.

2. The method of dealing with the subjects which has been adopted is briefly as follows. In paragraphs 3 to 17 the imports of the various kinds of steel and iron affected by the Board's proposals are examined, and the probable volume of importation is estimated—

(*a*) at the present rates of duty, and

(*b*) with the proposed new duties.

Next, in paragraphs 18 to 20, the Indian production of the same kinds of steel is reviewed and the future production estimated. These earlier paragraphs serve as material for an estimate (see paragraph 21) of the total Indian consumption during the next three years. The probable burden on the consumer is examined in paragraphs 24 to 30 and the effect on the Customs revenue in paragraphs 31 to 35. In all the figures given the imports of Government stores are included, and it is necessary to ascertain to what extent such stores will contribute to the increase in the Customs revenue. This cannot be done on the basis of the Trade Returns, which discriminate very imperfectly between the various kinds of iron and steel imported on Government account, and it has been necessary, therefore, to adopt a different method which is explained in paragraphs 32 to 34.

3. *Beams, pillars, girders and bridgework classified under iron and steel.*—The import figures are as follows :—

—	Imports.		Estimated quantity. Thousands of tons.	
	Thousands of tons.	Average value.	Fabricated.	Unfabricated.
		Rs. per ton.		
Average for the three years 1911-12 to 1913-14.	75	129	37	38
1921-22	58	281	29	29
1922-23	66	190	33	33
1923-24 (9 months' figures × 4/3)	72	176	36	36

The imports under this head no doubt include a certain proportion of iron, but the percentage will be small and may be neglected. For practical purposes the imports consist partly of fabricated steel and partly of unfabricated, but the two kinds can only be separated approximately. The average value as given in the Trade Returns suggests that the proportions may be half and half and the imports have been divided on this basis.

4. *Bridgework, classified under Railway plant and rolling stock.*—For practical purposes imports under this head may be taken as consisting entirely of fabricated steel. No Government stores are separately classified under this head. The import figures are :—

	Imports. Thousands of tons.
Average of the three years 1911-12 to 1913-14 . .	15
1921-22	15
1922-23	9
1923-24 (9 months' figures × 4/3)	16

5. *Other manufactures of iron and steel.*—A certain amount of fabricated steel must be included under other manufactures of iron and steel. The import figures are :—

—	Imports.	Estimated quantities of fabricated steel included under this head.
	Thousands of tons.	Thousands of tons.
Average of the three years 1911-12 to 1913-14	36	12
1921-22	50	16
1922-23	29	9
1923-24 (9 months' figures × 4/3) . .	17	5

The decrease in imports during the last two years is apparently due to some change in classification, and possibly the new definition of machinery has something to do with it. The quantity of fabricated steel included under this head has been taken as one-third of the total imports. This is pure conjecture for there is no means of ascertaining what the quantities actually are.

6. *Railway plant and rolling stock—other kinds.*—Under this head also some fabricated steel is probably included. The import figures are :—

— "	Imports.	Estimated quantities of fabricated steel.
	Thousands of tons.	Thousands of tons.
Average of the three years 1911-12 to 1913-14	52	17
1921-22	13	4
1922-23	16	5
1923-24 (9 months' figures × 4/3) . .	19	6

In this case also there has been a marked fall in the imports as compared with the pre-war figures, and the explanation must presumably be a change in classification. The estimate given above that the fabricated steel is about one-third of the total is again pure conjecture.

7. *Totals for fabricated steel.*—On the basis of the figures in the last four paragraphs, the imports of fabricated steel are as follows :—

	Imports of fabricated steel. Thousands of tons.
Average of the three years 1911-12 to 1913-14 .	81
1921-22	65
1922-23	55
1923-24 (9 months' figures × 4/3)	63

The probable imports of fabricated steel at the present rate of duty may be put at 65,000 tons. An increase in the duty to 25 per cent. might reduce the imports to 55,000 tons.*

*Only the reduction likely to follow a rise in prices has been taken into account here, and not the reduction due to an increase in the Indian outpnt. This remark applies also to the reductions estimated in paragraphs 8 to 14 and 17.

8. *Structural shapes*, i.e., *beams, joists, angles, channels, etc., unfabricated.*—The import figures (in thousands of tons) are :—

—	Average of the three years 1911-12 to 1913-14.	1921-22.	1922-23.	1923-24 (9 months' figures × 4/3).
Beams, pillars, girders, etc., unfabricated (see paragraph 3)	38	29	33	36
Angles	35	19	22	23
Channels . . . . . (including estimated quantity imported as Government stores).	6	6	5	4
Total .	79	54	60	63

The probable imports at the present rate of duty may be put at 65,000 tons. An increase of the duty to above 20 per cent. might reduce the imports to 55,000 tons.

9. *Steel Bars.*—The import figures are :—

	Imports. Thousands of tons.	Average value. Rs. per ton.
Average of the three years 1911-12 to 1913-14 .	115	101
1921-22	132	285
1922-23	189	153
1923-24 (9 months' figures × 4/3) . . .	147	146

The figures for the year 1922-23 are evidently abnormal. With the present duty the probable imports might be put at 145,000 tons. Allowance must be made for the bars made of steel of special qualities which will remain subject to the present duties. The import values suggest that the quantities of such bars cannot exceed 10,000 tons. The net imports of common bar may be put at 135,000 tons, and an increase of the duty to Rs. 40 a ton might reduce imports to 115,000 tons. About one-fifth of the bars are probably fabricated before they reach the consumer.

10. *Sheets and plates not galvanised or tinned.*—The Trade Returns of private imports separate—

(*a*) galvanised sheets,

(*b*) tinplate, and

(*c*) sheets and plates not galvanised or tinned,

but black sheets and plates are not separated. The returns of imports of Government stores include sheets and plates of all kinds under a single entry. The import figures are :—

	Total imports. Thousands of tons.	Average value per ton.	Estimated quantity. Thousands of tons.	
			Sheets.	Plates.
Average of the three years 1911-12 to 1913-14 . .	100	134	50	50
1921-22	65	271	33	32
1922-23 . .	100	194	50	50
1923-24 (9 months' figures × 4/3)	106	167	53	53

The totals given above include an estimate (about 4,000 tons) of the Government importations. In the absence of any definite data, it has been assumed that half the imports are plates and half sheets. The probable importations at the present rates of duty may be taken as 50,000 tons in each case. A deduction of 5,000 should be made from both totals on account of those kinds which will not be affected by the new duties (chiefly boiler plates and bright rolled sheets). The imports of sheets and plates may then be taken as 45,000 tons in each case. An increase of the import duty to 20 per cent. on plates and 15 per cent. on sheets may reduce the imports to 40,000 tons of each kind.

11. *Galvanised sheets.*—The import figures are :—

	Imports. Thousands of tons.
Average of the three years 1911-12 to 1913-14 . .	210
1921-22	89
1922-23	123
1923-24 (9 months' figures × 4/3)	150

The post-war imports have been steadily increasing, but are still much below the pre-war figures. The probable imports at the present rate of duty may be put at 150,000 tons. An increase in the duty to 15 per cent. might reduce the imports to 140,000 tons.

12. *Tinplate.*—The import figures are :—

	Imports. Thousands of tons.
Average of the three years 1911-12 to 1913-14	39
1921-22	25
1922-23	44
1923-24 (9 months' figures × 4/3)	48

The probable imports at the present rate of duty may be put at 50,000 tons. An increase in the duty from 10 to 15 per cent. might reduce the imports to 45,000 tons.

13. *Wire, other than fencing wire.*—The import figures are :—

	Imports. Thousands of tons.
1921-22	3
1922-23	4
1923-24 (9 months' figures × 4/3)	6

The probable imports at the present rate of duty may be taken as 5,000 tons, of which 4,000 tons may be affected by the increased duties. Any decrease in imports occasioned by the higher duty may be neglected. Fencing wire has been omitted from the above figures as it will not be affected by the increased duties.

14. *Wire nails.*—The import figures are :—

	Imports. Thousands of tons.
1921-22	7
1922-23	13
1923-24 (9 months' figures × 4/3)	11

The probable imports at the present rate of duty may be taken at 12,000 tons. An increase in the rate of duty might reduce the imports to 10,000 tons.

15. *Rails and fishplates for Railways.*—The import figures are :—

	Imports. Thousands of tons.
Average of the three years 1911-12 to 1913-14	161
1921-22	73
1922-23	98
1923-24 (9 months' figures × 4/3)	77

The present rate of importation may be taken as 80,000 tons, but the evidence given by the Railway Board shows that the average imports for the next three years would, in any case, be much lower. In 1924-25 about 100,000 tons of rails will be required by all the Railways in India, and the Tata Iron and Steel Company are already producing about 75,000 tons. No material change is proposed in the rate of duty.

16. *Rails and fishplates other than those for Railways—*

	Imports. Thousands of tons.
Average of the three years 1911-12 to 1913-14 . .	14
1921-22	22
1922-23	16
1923-24 (9 months' figures × 4/3)	7

The bulk of these imports probably consist of tramway rails and heavy rails for consumers other than the Railway administrations. These are not affected by the higher duties. The imports of light rails (under 30 lbs.), on which a higher duty has been proposed, cannot be put higher than 3,000 tons.

17. *Wrought iron angles and bars.*—The import figures are :—

	Imports. Thousands of tons.		Average value Rs. per ton.	
	Angles.	Bars.	Angles.	Bars.
Average of the three years 1911-12 to 1913-14.	2	24	141	125
1921-22	0·5	17	359	292
1922-23	0·8	22	305	204
1923-24 (9 months' figures × 4/3) .	0·4	11	190	195

The imports of wrought iron angles are negligible. The probable imports of iron bars at the present rate of duty cannot be put higher than 11,000 tons. The average values suggest that more than a third of the imports are of superior qualities which will not be affected by the increase in duty. The imports likely to be affected may be put at 7,000 tons, which might drop to 6,000 tons if the duty were raised to 25 per cent.

18. *Production of the Tata Iron and Steel Company.*—The actual production, in tons, for the last two years is as follows :—

——	Rails.	Light rails and fishplates.	Structurals	Bars and light structurals.	Plates.
1921-22 . . .	77,880	6,580	18,393	23,018	...
1922-23	65,358	5,506	17,301	26,670	1,833
Average . . .	71,619	6,043	17,847	24,844	1,833

This production of the Tata Iron and Steel Company may be roughly divided as follows :—

	Thousands of tons.
Rails and fishplates	75
Light rails	3
Heavy structurals	18
Light „	5
Bars	20

The present production of plates is negligible.

19. *Estimated production of the Tata Iron and Steel Company during the years 1924-25 to 1926-27.*—In order that the burden on the consumer and the effect on the Customs revenue of the increased duties may be calculated, it is necessary to estimate the production of the Tata Iron and Steel Company during the next three years. Statement I (annexed) gives the figures. The total outturn of finished steel is limited by—

(*a*) the outturn of steel ingots, and

(*b*) the extent of the market for the Company's products.

The total production has been estimated as follows :—

	Tons.
1924-25	250,000
1925-26	335,000
1926-27	390,000

The distribution of the total over the various products may, of course, vary widely. The general principle followed in estimating is a gradual increase towards the full output which the Company anticipate. One important modification has been made, however. The total eventual output of the new and old rail mills is 235,000

tons, comprising both rails and structural shapes. The Company hoped that the rail production would amount to 150,000 tons, but it seems impossible that this figure can be attained in the next three years. The estimated consumption of rails in 1924-25, as given by the Railway Board, is 100,000 tons, and any increase above that figure in the next two years depends on the sums allotted for new construction. In the estimate, therefore, the quantities of rails have been reduced and those of structurals proportionately increased. The surplus capacity of most of the new mills will enable the Company, within limits, to divert its output from one product to another. This has one important consequence. If the Company makes fewer rails and more structurals and bars, the imports of the latter will decrease, and consequently the Customs revenue, but simultaneously the bounty payable on rails will also fall. Conversely, if rail production (and consequently the bounty) is high, the output of bars and structurals will decline, and the Customs revenue from imported steel will increase.

20. *Estimated Indian production of tinplate, wire and wire nails for the next three years*,—The present production of tinplate, wire and wire nails is negligible. In 1924-25, however, the Tinplate Company should reach an output of 21,000 tons, and in each of the two following years its full output of 28,000 tons. The Indian production of wire and wire nails can only be estimated very roughly. The following figures have been taken :

	Wire.	Wire nails.
	Tons.	Tons.
1924-25	1,000	1,000
1925-26	2,000	2,000
1926-27	3,000	3,000

21. Statement II shows the estimated Indian consumption of the various kinds of steel and wrought iron affected by the new duties, (*a*) as at present, and (*b*) in each of the next three years, the total being divided between Indian production and imports. It has been assumed that, as a result of the new duties, consumption will fall substantially in 1924-25, but that half the drop will be recovered in 1925-26 and half in 1926-27. The consumption of steel is tending to increase, and it is thought that the effect of a higher duty will be a temporary set-back and not a permanent reduction of the demand.

22. One point in Statement II requires explanation, *viz.*, that no fabricated steel is shown as produced in India. The reason

is that such steel is made either from the Jamshedpur production or from imported raw steel, and to include it in the statement would mean counting the same steel twice over. It is assumed in the statement that the increase in the production of structurals by the Tata Iron and Steel Company displaces equal quantities of fabricated and unfabricated imports.

23. Statement III shows the estimated Customs revenue, (*a*) at present and (*b*) in each of the three years 1924-25 to 1926-27. The estimate of the revenue is, of course, based on the estimated imports in Statement II. Before the figures in this statement are discussed, it is convenient for certain reasons to pass on to the burden on the consumer.

24. Statement IV is the basis of the calculation of the probable burden on the consumer. Three assumptions have been made—

(1) That the price of steel is raised by the full amount of the increase in the duty.

(2) That the consumption of steel remains at its present level and does not fall on account of the new duties.

(3) That the whole of the structural shapes and plates, and one-fifth of the steel bars, are fabricated before they reach the consumer, and that the burden on him is, therefore, the difference between the old and the new duties on fabricated steel.

The total burden as shown in the statement is Rs. 164·5 lakhs, and it seems probable that this is an outside estimate. In particular the third assumption cannot be right for, when the consumer himself does the fabrication, as Railway administrations sometimes do, the extra cost to him is only the difference between the old and the new duties on raw steel. It seems desirable, however, to get a maximum estimate, and for this reason no allowance has been made for factors which would tend to reduce it.

25. The different kinds of steel included in the statement and the extra burden imposed on the consumer can be classified as follows :—

A. Steel which goes entirely into general consumption

	Burden.
	Rs. lakhs.
Tinplate	10

B. Steel the bulk of which goes into general consumption, but of which some proportion (say one-third) is taken up by the Railways and the principal industries—

	Burden. Rs. lakhs.
Galvanised sheets	22·50
Steel bars	32·24
Iron bars	3·84
Wire nails	1·47
Total	60·05

C. Steel the great bulk of which is used by Government, public bodies, the Railways and the principal industries, but of which some part is used in buildings other than industrial or Government buildings.

	Burden. Rs. lakhs.
Fabricated steel	85·87

D. Steel the whole of which may be taken as consumed by Government, public bodies, the Railways and the principal industries.

	Burden. Rs. lakhs.
Black sheets	5·62
Light rails	1·56
Wire	1·40
Total	7·58

26. On the basis of the figures given above, the burden on the general consumer may be calculated as follows :—

	Rs. lakhs.
A	10·00
B	40·03
C	7·50
Total	57·53

The figure entered against C is based on an estimate of 20,000 tons of fabricated steel used annually for the construction of buildings other than Government and industrial buildings.

27. The other consumers fall naturally into two classes—

(1) The Government of India, the Local Governments, the Indian States, Railways, Port Trusts and other public bodies.

(2) The principal industries, including all the industries covered by the annual return of large industrial establishments in India, and also the mining industries, river transport and oil distribution.

28. The estimate for the first class is as follows :—

	Rs. lakhs.
Railways	29·00
Local Governments	6·50
Port Trusts	5·50
Government of India departments	3·00
Indian States	3·00
Public bodies	3·00
Total	50·00

The manner in which the Railway estimate has been arrived at is explained in paragraph 130 of the First Report. The estimate for Local Governments is based on figures supplied by them of the quantities of steel they are likely to require during the next five years. The Port Trust estimate is based largely on figures supplied by the Calcutta Port Trust. The last three entries are pure conjecture.

29. The balance of the burden still to be accounted for is Rs. 57 lakhs. The jute and cotton industries between them should account for about four-ninths of the total, and the other industries for the balance. Amongst the latter the most important probably are the coal mines, the tea industry and the engineering firms, in so far as the last named actually absorb steel and do not merely fabricate it and pass it on. Allowance must also be made for considerable quantities of steel used for the construction of oil tanks all over the country, for the launches, flats and barges employed in river transport, and also for ship repairs at the principal ports. The only definite figure ascertained for any particular industry is that of Rs. 7½ lakhs for the jute industry (*vide* paragraphs 139 and 140 of the First Report.) If that figure were raised by 20 per cent. to Rs. 9 lakhs, then jute and cotton together might account for Rs. 20 lakhs and the other industries for Rs. 25 lakhs, or Rs. 45 lakhs

in all. It does not seem likely that the actual burden on industries would be higher than that. But even if the figure of Rs. 57 lakhs be taken as correct, the total burden on the jute industry would not be more than Rs. 11 lakhs, of which at least a third would be capital expenditure.

30. It is not, of course, to be expected that, in a rough calculation of this kind, exactly the same total should be arrived at by two different methods, and a difference of about ten per cent. is well within the limits of possible accuracy. The discrepancy may be explicable in half a dozen different ways, but there seems to be reason for thinking that the estimate of Rs. 164·5 lakhs as the burden on the consumer is too high. Probably it would be a reasonable estimate to say that the burden on the consumer is in the neighbourhood of Rs. 1½ crores, of which rather more than a third falls on the general consumer, rather less than a third on the principal industries, and about a third on Governments, public bodies and the Railways. This would agree well enough with the statement of some of the engineering firms that their sales to Government, the Railways and public bodies were more than half their total sales.

31. It remains to discuss the estimate of the Customs revenue and the manner in which it will be affected by the Board's proposals. It is assumed in Statement III that Customs duties are payable by all consumers, including the Railways and the Government departments. This will in fact be the case if the law is amended in accordance with a Bill recently introduced by the Government of India. It is desirable to ascertain, however, what part of the additional revenue resulting from the higher duties will be paid by the Railways and the Government departments because this portion may not be a real addition to the resources of Government. The calculation is not an easy one and necessarily is only approximate.

32. In order to get an estimate at all, it is necessary to determine in some way to what extent the Railways and the Government departments will purchase in India instead of importing. The most natural assumption is that they will do so in the same proportion as other purchasers of the kinds of steel they require. The second difficulty is to ascertain the kinds of steel likely to be purchased. In this case, the best course seems to be to adhere to the distribution that was adopted in dealing with the burden on the consumer (see paragraph 25). Statements V and VI have been prepared in accordance with these two assumptions. The comparison is between the present figures and those for the year 1926-27. In the two intervening years a reduction in consumption is expected, and this is a complication which it is

desirable to avoid. Both the Indian production and the imports have been divided between—

(*a*) Governments, public bodies, Railways and the principal industries, and

(*b*) the general consumer.

In Statement VI the Customs revenue payable by these two classes has been estimated both as at present and in 1926-27. The following points may be explained.

(1) The general consumer is assumed to absorb 20,000 tons of structural steel, two-thirds of the galvanised sheets, iron bars and wire nails, and the whole of the tinplate.

(2) The distribution of the steel bars is a little more complicated. One-fifth is assumed to be fabricated in India and taken up by the Governments, Railways, etc., *plus* one-third of the balance. The remainder falls to the general consumer.

33. It will be seen from Statement VI that the Customs revenue paid by the general consumer rises from Rs. 66·42 lakhs to Rs. 84·82 lakhs, while the revenue which comes in from Government, the Railways and the principal industries increases to a smaller extent from Rs. 63·86 to Rs. 73·37 lakhs. The reason for this is that the important items in the case of the general consumer are galvanised sheets and steel bars, the Indian production of which will be comparatively small, while Government, the Railways and the industries absorb most of the structural steel and plates, the Indian production of which promises to be large. This is of importance, because it suggests that most of the increase in revenue comes from outside and not from Government itself in another incarnation.

34. In calculating the burden on the consumer the following estimate was given of the shares of various classes.

	Rs. lakhs.
Railways	29
Local Governments	6·5
Port Trusts	5·5
Government of India departments	3·0
Indian States	3·0
Public bodies	3·0
Total	50·0

If the share of the principal industries is also taken as Rs. 50 lakhs, then the total burden (excluding the share of the general consumer) is Rs. 100 lakhs and the shares in the burden falling

to the Railways, Local Governments and the Government of India departments can be treated as percentages of that total. The increase in the Customs revenue not attributable to the general consumer has been calculated on exactly the same data as the burden, and these percentages can therefore be applied to it. The estimated results are as follows :—

	Estimated Customs Revenue. In lakhs of rupees.		
	Present.	1926-27.	Increase.
Railways	18·50	21·28	2·78
Local Governments	4·15	4·77	·62
Government of India departments .	1·95	2·20	·25
Total .	24·60	28·25	3·65

When the contracts of the East Indian and Great Indian Peninsula Railways expire, the State Railways will account for approximately two-thirds of the Railway expenditure. The State Railway share of the Railway figure given above is therefore about Rs. 1·86 lakhs. The portion of the increase in Customs revenue payable in one form or another by Government itself may be put at Rs. 3 lakhs in round figures.

35. The general position as regards the increase in Customs revenue can now be reviewed. The following table gives the important figures.

	Estimated Customs Revenue.	Estimated Excess over present Customs Revenue.		
	Present.	1924-25.	1925-26.	1926-27.
	Rs. lakhs.	Rs. lakhs.	Rs. lakhs.	Rs. lakhs.
	130·23	42·92	28·19	27·92
Deduct revenue payable by Government itself.	...	4·00	3·50	3·00
Balance .	...	38·92	24·69	24·92
Required for bounty on rails and fishplates.	..	26·56	27·30	25·00
Balance .	...	+ 12·36	— 2·61	— 0·08

The increase in revenue payable by Government itself will be somewhat larger in 1924-25 and 1925-26 than in 1926-27, but only approximate figures can be given. The estimate of the bounties payable is based on the estimate of the Tata Iron and Steel Company's production in Statement I. It will be seen that there is a substantial balance in hand in 1924-25 after payment of the bounties on rails and small debit balances in the next two years.

No account has been taken in the above figures of the bounties proposed to be granted on the manufacture of Railway wagons (see paragraph 25 of the Second Report). The expenditure on these bounties will amount to about Rs. 7 lakhs annually. The increase in Customs revenue in 1924-25 will more than cover this sum, but in the two following years the burden will fall on general revenues.

STATEMENT I.

Estimated production of the Tata Iron and Steel Company for the next three years.

(In thousands of tons.)

—	Average production of 1921-22 and 1922-23.	1924-25.	1925-26.	1926-27.
Rails and fishplates	75	88	105	125
Light rails	3	4	5	5
Structural shapes	23	68	85	100
Bars	20	30	45	45
Plates	...	15	30	45
Black sheets	...	7	15	17
Galvanised sheets	...	8	15	18
Sheet bars	...	35	35	35
TOTAL	121	250	335	390

STATEMENT II.

Estimated Indian consumption (in thousands of tons) of the various kinds of Steel and Wrought Iron on which higher duties have been proposed.

	Present.			1924-25.			1925-26.			1926-27.		
	Total Indian consumption.	Indian production.	Imports.	Total Indian consumption.	Indian production.	Imports.	Total Indian consumption.	Indian production.	Imports.	Total Indian consumption.	Indian production.	Imports.
	a	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*	*a*	*b*	*c*
1. Fabricated steel	65	...	65	55	...	32	60	...	29	65	...	26
*2. Structural steel (unfabricated)	88	23	65	78	68	33	83	85	29	88	100	27
3. Total of 1 and 2	153	23	130	133	68	65	143	85	58	153	100	53
4. Plates	45	...	45	40	15	25	42	30	12	45	45	...
5. Black sheets	45	...	45	40	7	33	42	15	27	45	17	28
6. Galvanised sheets	150	...	150	140	8	132	145	15	130	150	18	132
7. Steel Bars	155	20	135	135	30	105	145	45	100	155	45	110
8. Wrought Iron Bars	7	...	7	6	...	6	7	...	7	7	...	7
9. Light rails	16	3	3	6	4	2	6	5	1	6	5	1
10. Tinplate	50	...	50	45	21	24	48	28	20	50	28	22
11. Wire	4	...	4	4	1	3	4	2	2	4	3	1
12. Wire Nails	12	...	12	10	1	9	11	2	9	12	3	9
13. Total of 3 to 12	627	46	581	559	155	404	593	227	366	627	264	363

* See paragraph 22 of the Note.

STATEMENT III.

Estimated Customs Revenue from the various kinds of Steel and Wrought Iron on which higher duties have been proposed.

Note.—In each entry the first figure is the estimated imports in thousands of tons, and the second figure is the Customs duty in Rupees per ton.

	Estimated Revenue in lakhs of Rupees.			
	Present.	1924-25.	1925-26.	1926-27.
(1) Fabricated steel	65 × 25 = 16·25	32 × 62·5 = 20·00	29 × 62·5 = 18·12	26 × 62·5 = 16·25
(2) Structural steel	65 × 15 = 9·75	33 × 30 = 9·90	29 × 30 = 8·70	27 × 30 = 8·10
(3) Plates	45 × 15 = 6·75	25 × 30 = 7·50	12 × 30 = 3·60	0 × 30 = 0·00
(4) Black sheets	45 × 17·5 = 7·87	33 × 30 = 9·90	27 × 30 = 8·10	28 × 30 = 8·40
(5) Galvanised sheets	150 × 30 = 45·00	132 × 45 = 59·40	130 × 45 = 58·50	132 × 45 = 59·40
(6) Steel bars	135 × 14 = 18·90	105 × 40 = 42·00	100 × 40 = 40·00	110 × 40 = 44·00
(7) Iron bars	7 × 14 = ·98	6 × 35 = 2·10	7 × 35 = 2·45	7 × 35 = 2·45
(8) Light rails	3 × 14 = ·42	2 × 40 = ·80	1 × 40 = ·40	1 × 40 = ·40
(9) Tinplate	50 × 40 = 20·00	24 × 60 = 14·40	20 × 60 = 12·00	22 × 60 = 13·20
(10) Wire	4 × 25 = 1·00	3 × 60 = 1·80	2 × 60 = 1·20	1 × 60 = ·60
(11) Wire nails	12 × 28 = 3·36	9 × 60 = 5 40	9 × 60 = 5·40	9 × 60 = 5·40
Total	130·28	173·20	158·47	148·20

STATEMENT IV.

Estimated Burden on the Consumer arising from the higher prices of Steel and Wrought Iron likely to follow the higher duties proposed.

1	2	3	4	5	6
——	Indian consumption at present rate. Thousands of tons.	Present duty. Rs. per ton.	Proposed duty. Rs. per ton.	Difference between (4) and (3). Rs. per ton.	Additional price paid by consumer (2) × (5) Rs. lakhs.
(1) Imported fabricated steel	65	...	...	...	...
(2) Structural steel fabricated in India	88	...	...	...	...
(3) Plates fabricated in India	45	...	...	...	...
(4) Steel bars fabricated in India, one-fifth of total consumption.	31	...	...	...	...
(5) Total fabricated steel	229	25	62·5	37·5	85·87
(6) Black sheets	45	17·5	30	12·5	5·62
(7) Galvanised sheets	150	30	45	15	22·50
(8) Steel bars—unfabricated, four-fifths of total consumption.	124	14	40	26	32·24
(9) Iron bars	7	14	35	21	1·47
(10) Light rails	6	14	40	26	1·56
(11) Tinplate	50	40	60	20	10·00
(12) Wire	4	25	60	35	1·40
(13) Wire nails	12	28	60	32	3·84
(14) Grand total	627	...	...	...	164·50

STATEMENT V.

Distribution (in thousands of tons) of the estimated Indian consumption of Steel and Wrought Iron (including both the Indian production and imports), between Group A Government, the Railways, Public bodies and the principal Industries, and Group B the general consumer.

	Total consumption.	PRESENT.						1926-27.					
		Indian production.			Imports.			Indian production.			Imports.		
		Total.	Absorbed by		Total.	Absorbed by		Total.	Absorbed by		Total.	Absorbed by	
			Group A.	Group B.		Group A.	Group B.		Group A.	Group B.		Group A.	Group B.
(1) Structural steel (fabricated)	65	...	...	...	65	56·5	8·5	...	...	...	26	23	3
(2) Structural steel (unfabricated)	88	23	20	3	65	56·5	8·5	100	...	...	27	23	4
(3) Total structural steel	153	23	20	3	130	113	17	100	87	13	53	46	7
(4) Plates	45	...	...	...	45	45	...	45	45	...	...	...	...
(5) Black sheets	45	...	..	...	45	45	...	17	17	...	28	28	...
(6) Galvanised sheets	150	...	...	...	150	50	100	18	6	12	132	44	88
(7) Steel bars	155	20	9	11	135	63	72	45	21	24	110	51	59
(8) Iron bars	7	...	...	...	7	2	5	...	...	...	7	2	5
(9) Light rails	6	3	3	...	3	3	...	5	5	...	1	1	...
(10) Tinplate	50	...	...	...	50	...	50	28	...	28	22	...	22
(11) Wire	4	...	...	...	4	4	...	3	3	...	1	1	...
(12) Wire nails	12	..	...	...	12	4	8	3	1	2	9	3	6
(13) Total	627	46	32	14	581	334	247	264	185	79	363	181	182

STATEMENT VI.

Estimated Customs Revenue in lakhs of Rupees payable by (*a*) Governments, the Railways, Public bodies and the principal Industries, and (*b*) the general consumer.

Note.—In each entry the first figure is the estimated imports in thousands of tons, and the second figure is the Customs duty in Rupees per ton.

	Railways, Public bodies, Governments and Industries.		General consumer.	
	Customs Revenue.		Customs Revenue.	
	Present.	1926-27.	Present.	1926-27.
(1) Structural steel (fabricated)	56·5 × 25 = 14·12	23 × 62·5 = 14·37	8·5 × 25 = 2·12	3 × 62·5 = 1·87
(2) Ditto (unfabricated)	56·5 × 15 = 8·48	23 × 30 = 6·90	8·5 × 15 = 1·28	4 × 30 = 1·20
(3) Total structural steel	22·60	21·27	3·40	3·07
(4) Plates	45 × 15 = 6·75	*Nil.*	*Nil.*	*Nil.*
(5) Black sheets	45 × 17·5 = 7·87	28 × 30 = 8·40	*Nil*	*Nil.*
(6) Galvanised sheets	50 × 30 = 15·00	44 × 45 = 19·80	100 × 30 = 30·00	88 × 45 = 39·60
(7) Steel bars	63 × 14 = 8·82	51 × 40 = 20·40	72 × 14 = 10·08	59 × 40 = 23·60
(8) Iron bars	2 × 14 = ·28	2 × 35 = ·70	5 × 14 = ·70	5 × 35 = 1·75
(9) Light rails	3 × 14 = ·42	1 × 40 = ·40	*Nil.*	*Nil.*
(10) Tinplate	*Nil.*	*Nil.*	50 × 40 = 20·00	22 × 60 = 13·20
(11) Wire	4 × 25 = 1·00	1 × 60 = ·60	*Nil.*	*Nil.*
(12) Wire nails	4 × 28 = 1·12	3 × 60 = 1·80	8 × 28 = 2·24	6 × 60 = 3·60
Total (3) to (12)	63·86	73·37	66·42	84·82

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Third Report.

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CHAPTER I.

Comparison of Costs of Steel Manufacture in India with those in other Countries.

Contents of the Third Report.

We have already submitted to the Government of India, in our First and Second Reports, certain proposals for the grant of protection to the steel industry. It remains now for us to give expression to our views on three branches of the subject—locomotive building, steel casting and enamelled ware—regarding which we have at present no recommendations to make. These are dealt with in Chapters II to IV. We have taken the opportunity also to explain, in this Chapter, the reasons why in our First Report we have not attempted to make a detailed comparison between the costs of steel manufacture in India and the corresponding costs in other countries. We have attached three annexures to this Report:

Annexure A.—A brief summary of our proceedings during our enquiry into the steel industry.

Annexure B.—A memorandum, prepared by one of the Members of the Board, regarding the manufacture of wire. This memorandum formed the basis of Chapter V of our Second Report.

Annexure C.—A note on the increased cost of wagons manufactured in India arising from the higher duties proposed on rolled steel (see Chapter III, paragraph 25 of the Second Report).

Desirability of comparing Indian with foreign costs.

2. In paragraph 102 of our First Report we alluded to the special difficulty in our enquiry created by the fact that, at present, rolled steel is manufactured in India by only one firm. In these circumstances a direct comparison between the actual cost of manufacture at Jamshedpur with the corresponding costs in other countries would clearly be valuable. If this comparison could be made, item by item, at every stage of the processes by which pig iron is converted into the finished steel section, and if in the case of each item the extent of the handicap or the advantage arising from Indian conditions (whether economic, technical, social or climatic) could be calculated, a means would be provided by which the measure of success attained at Jamshedpur could be estimated. The desirability of a comparison of this kind was suggested to us by some of the witnesses, and one—Mr. Homi, whom we examined at Bombay—laid before us certain statements about

costs in the United States of America which he considered would form a satisfactory basis for the comparison.

Up-to-date figures for costs in other countries not available.

3. A satisfactory comparison of steel making costs is, however, a difficult matter. The initial difficulty is to obtain any reasonably complete statement of costs for other countries. A good deal of information is available about American and German pre-war costs, and to a smaller extent about American post-war costs. But at the present time competition with the Indian steel industry comes chiefly from England and Belgium, and it is precisely for these two countries that recent information is least complete. As regards Belgium (and this applies to Germany also) the difficulty of converting costs incurred and recorded in a depreciated currency into their real equivalent in a rupee or sterling currency with the accuracy required for a useful comparison is practically insurmountable. English manufacturers on the other hand rarely allow more than isolated items of their costs to become available for public use, and since conditions became relatively stable (*e.g.*, since the middle of 1922), no reliable statement of costs has been published in sufficient detail to justify a comparison with Indian costs. The published figures about American costs are less incomplete than the English or Belgian. But they are higher than European costs and on that account are not satisfactory as a basis of comparison for our purpose, and they are open to the same difficulties of interpretation as most statements of works costs.

Difficulty of interpreting statements of works costs from other countries.

4. Of the various statements of costs from different sources which we have considered, no two are in quite the same form or distribute their charges between the same detailed items. Two instances from our own enquiry will illustrate the real difficulty of making accurate comparisons of the statements issued by different works. In Table VI attached to their first representation, the Tata Iron and Steel Company presented detailed statements of their costs, but it was only after oral examination that we could be certain of the precise meaning of some of the items (*e.g.*, whether in Table VI-A the labour employed in furnace relining, or at the gas producers, was or was not included in the item "labour,' and where the division was made between "refractories" and "relining"). Secondly, when we examined Mr. Alexander, General Superintendent of the Works at Jamshedpur, he submitted tabular statements of costs at certain works in Canada and the United States. In the Canadian figures the difference between the cost per ton of pig iron and of steel ingots was unusually low. From his knowledge of the actual circumstances Mr. Alexander was able to explain that, in the works whose figures he had given, a large proportion of exceptionally cheap scrap was used. Any direct comparison of these costs with the Jamshedpur costs would, without such an explanation, have been not merely useless but misleading.

Necessity of allowances for varying conditions.

5. The examples just mentioned indicate the caution with which ordinary statements of costs must be considered. In the conversion of pig iron to rolled steel the cost is affected by many variable factors such as the amount of impurities in the pig iron, the availability of scrap, the rates of wages, the prices of materials, the quality of the materials available for building and lining the furnaces, the quality of such feeding materials as lime, the quality of the steel required by the market, the number of different qualities required and the size of the market for each particular size of each product. None of these factors is entirely under the control of the individual manufacturer. It can safely be said that there are no two important steel-making districts in the world where all these factors are identical. The importance of the technical conditions is illustrated inside the Indian iron and steel industry itself. The Indian manufacturer does not claim to be more efficient in blast furnace practice than his Western competitor merely because he can make pig iron more cheaply in present circumstances; and similarly it would not be just to condemn him for inefficiency merely because he is unable at present to make steel as cheaply as European manufacturers.

Higher costs in India owing to importation of machinery and stores.

6. It may be useful if we draw attention here to an item in the costs of manufacture in India which not merely adds to the difficulty of comparison, but is also of substantial importance in itself, and in a greater or less degree affects all industries. The Indian manufacturer must import practically the whole of his plant and machinery for the manufacture of iron and steel, and also a large proportion of his consumable stores and spare parts. On these imports he has to pay large sums for sea freight and for Indian Customs duties. These materials are drawn almost entirely from the highly industrialised countries where steel is made on a large scale. Steel makers in those countries have only trifling charges to bear corresponding with the freights and duties which the Indian manufacturer must pay. These additional charges affect the depreciation, the working capital on which interest has to be provided and many items of the works costs of the Indian steel maker; and by their effect on the capital expenditure they raise the profit which he must earn on each ton of output. These additional charges go far to nullify—and indeed may do so completely—the "natural" protection which it is sometimes contended the Indian manufacturer receives in the freight charges on imported steel.

Comparison of technical methods.

7. We have shown that the efficiency of the operations at Jamshedpur cannot be compared with that in other countries merely by the tabulation of costs under items apparently similar. Any comparative statement we could compile would be misleading unless it were accompanied by an explanation, usually very technical, for almost every item. For these reasons we have not thought it desir-

able to present such a statement. But in consultation with our technical adviser, Mr. Mather, we have considered all the information we could obtain about costs in other countries, and in forming our opinion as to the efficiency of the technical management of the Jamshedpur works we have taken this information into account. It is not only costs, however, which have occupied our attention. We have also, wherever possible, endeavoured to compare the operation methods at Jamshedpur with those in other countries, and especially the rate of output of the steel furnaces and the fuel consumption. Comparisons on this basis also necessitate allowances for varying conditions, but they can be made with greater accuracy, since more knowledge is available about the processes employed in other countries and their results than about costs.

Mr. Homi's evidence.

8. We have not found that Mr. Homi's evidence supplied what was needed in this respect. The comparisons which he made were entirely with American practice, but in most cases he was unable to give us that detailed information about the working conditions in the American plants used as examples which alone would have enabled a satisfactory comparison to be made. And where his own statements showed definitely that the conditions were not directly comparable, he failed to appreciate the importance of the difference. Mr. Homi's acquaintance with the methods of manufacture of steel is too limited and superficial to justify us in attaching weight to his opinions. Throughout his evidence he displayed a pronounced tendency to ignore essential difficulties in India, to quote as typical of the practice at Jamshedpur incidents which occurred several years ago or details of procedure which have long been abandoned, and to use for his American basis results obtained in plants where the conditions are unusually favourable. Only by detailed criticism could the substratum of useful matter in his representation be reached, but the yield of properly substantiated facts was small, and we found that most of them related to subjects which we had already discussed with the Steel Company at out first meetings in Jamshedpur, or which we had taken up in the interval.

Board's decision on Mr. Homi's written statement.

9. There is one important aspect of Mr. Homi's evidence to which we had to give special attention. In his written representation he gave detailed figures for the costs of steel manufacture not only in America, but also in the works of the Tata Iron and Steel Company at Jamshedpur. It appeared certain that the latter figures could have been obtained only if Mr. Homi had access to the cost sheets and other confidential records of the Company: but in oral examination, while he admitted that he had in his possession complete cost and practice charts of the Company, he declined to say how he had got them. We considered carefully how far, if at all, we could place on our record information which the witness tendering it was not entitled to possess, and our decision was communicated to Mr. Homi in a

statement read by the President at a public sitting of the Board on the 17th November. It was in the following terms:—

"The Tariff Board have carefully considered how they should deal with the written statement you have submitted. That statement contains many figures relating to the operations of the Tata Iron and Steel Company, which were evidently obtained from copies of the complete cost and practice charts of the Company from 1912 onwards. These documents are in your possession although the Company treats them as confidential, and you have declined to inform the Board from what source you obtained them. The only inference the Board can draw is that you obtained them from servants of the Company whose duty it was to withhold the information.

"The Board feel that it would be contrary to the public interest if they were to accept as evidence, and give publicity to, information apparently obtained by methods open to the strongest objection. They must, therefore, decline at this stage to bring the written statement as it stands upon the record, or to proceed with your examination upon that basis. At the same time they recognize that there are a number of paragraphs in the written statement which are not open to objection on the ground stated. They have decided to limit their oral examination to those portions of the statement and they will resume the examination for this purpose at 3 P.M. on Monday, the 19th November, if the date and hour are convenient to you.

"The portions of the written statement which it will be necessary to exclude deal with many questions which have already received, and will continue to receive, the attention of the Board. It is their duty to acquaint themselves to the best of their ability with all the relevant facts. But they cannot take as the basis of their investigation information irregularly obtained. To do so would be to acquiesce in methods of which the Board emphatically disapprove.

"The Board will of course ask the Tata Iron and Steel Company for all information that appears to them necessary for the purposes of their enquiry, and the Company have at all times expressed their willingness to give all the information that might be asked for."

Principle underlying the decision.

10. We have thought it right to reproduce our decision in full because it lays down the general principle which in such matters will regulate our procedure. The danger of accepting as evidence information which the witness cannot authenticate is obvious, and we had no hesitation in excising from the record the figures relating to the Tata Iron and Steel Company which Mr. Homi had inserted in his written statement. When we visited Jamshedpur in December the Company itself supplied us with correct figures in place of those furnished by Mr. Homi, but we did not consider it necessary to reproduce them in the record. Mr. Homi's written statement does not furnish a satisfactory basis for examining the works costs of the Tata Iron and Steel Company, and for this reason we have not referred to his evidence in our First Report.

CHAPTER II.

The Locomotive Building Industry.

Peninsular Locomotive Company.

11. On the 30th September 1921, the Government of India published a communiqué in which *inter alia* the following statements occur:—

"In pursuance of their express policy of making India as far as possible independent of outside sources in the supply of materials for Railways, the Government of India have had under consideration the question of the construction of locomotives in India and they are now in a position to give a general undertaking that tenders will be invited annually in India for all the railway locomotives and locomotive boilers required by Government during the 12 years commencing with 1923. * * * It is estimated that the average annual requirements of Government will be 160 locomotive engines and 160 additional boilers during 1923 and 1924, and thereafter 400 locomotives and 400 additional boilers. * * * * Firms interested in the above announcement are invited to apply for further information, either to the Secretary, Railway Department, India, or to the High Commissioner for India, London."

On the 6th of December 1921 the Peninsular Locomotive Company, Limited, was incorporated in India. This is the only firm interested in the manufacture of locomotives in this country which has applied to us for protection of the industry, or, in the alternative, to render it assistance in some other form during its initial stages. The Company has a subscribed capital of Rs. 60 lakhs, all in ordinary shares. Its Board of Directors consists of seven members, of whom four are Indians. Its Chairman and Managing Director is Mr. Herbert Langham Reed, who is Chairman of a well-known English firm of locomotive manufacturers, Messrs. Kerr, Stuart and Company, Limited.

Equipment of the Company.

12. Though the Company was incorporated nearly two years ago, it has not commenced operations and its works, which are to have a capacity of about 200 locomotives per year, have not been completed. Most of the buildings have, however, been erected on a site at Jamshedpur leased from the Tata Iron and Steel Company, and we are informed that about Rs. 30 lakhs have been spent on these buildings and the necessary machinery, equipment and accessories. These are already on the site, and we have been told that within two or three months of obtaining the necessary order for locomotives the Company would be in a position to commence operations. Mr. Reed further states that arrangements

have also been made to secure the services of such European experts and foremen as may be necessary.

Claims of locomotive industry to assistance.

13. The industry, in our opinion, has strong claims to temporary national assistance. The works at Jamshedpur will be under the management of a firm of British manufacturers who have considerable experience in the manufacture of locomotives, and there is therefore every reason to believe that the works will be under efficient control. The industry is very valuable from the national point of view. Apart from its importance as affecting the question of national defence, it is an industry which gives ample opportunities for the purpose of training Indians in mechanical engineering, and if India is to make itself independent, as far as possible, in the supply of its Railway requirements, it is essential that in its industrial organisation it should possess a well-established locomotive industry. With regard to the supply of labour also, it is favourably situated, for it cannot be regarded as an industry in which all labour has to be specially trained. There are many engineering works, Railway workshops and factories where labour of the kind required in this industry is available at reasonable cost and in sufficient quantity. With regard to raw materials, it is estimated that about 50 per cent. of the total quantity of raw materials required in the manufacture of a locomotive can be obtained in India, either from the Tata Iron and Steel Company, Limited, or from other local firms engaged in the manufacture of iron or steel products, especially castings.

Necessity and measure of assistance.

14. We consider that the establishment of the manufacture of locomotives in India is desirable both on national grounds and because of its importance to the development of the steel industry. But so long as the prices of imported locomotives remain at the low level to which they have fallen during the last two years, it seems certain that Government assistance would be required. Mr. Reed estimated that, at the outset, the cost of a locomotive manufactured in India would exceed by about £2,000 the cost of an imported locomotive erected and ready to run.* Since no locomotives have yet been constructed at Jamshedpur, it is impossible to be sure whether the figure given is a reasonable one, but after examining the details of the estimate as given by Mr. Reed, we are inclined

* The prices paid by the Railway Board for 2-8-0 broad-gauge locomotives were—

1910-14 (average) . .	£ 4,116	f.o.b. English port.
1920	£13,633	f.o.b. English port.
1922	£ 5,120	f.o.b. English port.

The extra cost of freight, etc., and of erection in India would be about £600 in 1922.

Mr. Reed estimates that the present British price of this locomotive would be about £6,400 f.o.b. if a normal profit were to be obtained.

to think that some of the items have been put too high. Even if the protection required, however, was a good deal less than £2,000 a locomotive, it would still be a substantial sum, though probably not greater than has been found necessary for the protection of the locomotive industry in other countries such as Australia, where the import duty is 27½ per cent. *ad valorem*, and Canada, where it is 22½ per cent. The higher duties on imports of rolled steel which we have proposed would have increased the cost of each locomotive by a few hundred rupees only. We believe that we should have found it possible to make recommendations for the encouragement of this industry but for a complete change in the circumstances which has occurred since 1921.

Fiscal Commission's condition as to "large home market" not fulfilled.

15. The Fiscal Commission laid down several conditions which were to be fulfilled by any industry claiming protection. One of them was that the industry must possess "a large home market" for its products. The application of this criterion may occasionally present difficulties, but, in our opinion, it must mean the existence of a demand for the product in a quantity sufficiently large to make its production economically practicable. To put it in another way, the implication is that no industry ought to be protected unless its output is on a scale sufficiently big to make it possible for it to bring down its cost of production to the level at which it can, without national assistance, compete eventually with the foreign manufacture. In the case of the locomotive industry, it has been stated to us by Mr. Reed that production costs would not be economical if the capacity of the works was much less than 200 locomotives per year. It would follow from this that, if the industry is to be protected and is eventually to succeed, its market must be able to absorb at least that number. If the Company had started their operations a year or two ago, it would at that time unquestionably have had such a market, for it was definitely stated in the communiqué to which we have referred that the annual requirements of Government would be 160 locomotives and 160 additional boilers during each of the years 1923 and 1924, and 400 locomotives and 400 additional boilers a year thereafter. If the position had not changed since the date of that communiqué, the requirements of Government would thus have given enough work to two plants operating simultaneously, each of them turning out 200 locomotives a year. In the requirements of the Railways not owned by Government there was the possibility of some further market. Unfortunately, however, the position is now completely changed. Mr. Hindley, giving evidence before us for the Railway Board, has stated that the requirements of the Railways during 1924-25 would be only 60 locomotives, and that it was doubtful whether the requirements in any one of the next five years would be as high as 100 locomotives. The recommendations of the Inchcape Committee had led to a full review of the requirements of the Indian Railways in the matter of locomotives, with the result that means had been devised for utilizing

to better advantage the locomotives the Railways already had, so that the need for new locomotives was diminished. The projected electrification of the Railways in the neighbourhood of Bombay would lead to a further economy, for about 300 steam locomotives would be set free for use elsewhere.

Difficulty caused by restricted market.

16. If the requirements during the next five years of all the Railways owned by Government will not exceed 100 locomotives in any one year, it is clear that no protection, or assistance in any other form, can be recommended by us in respect of this industry, with due regard to the immediate or ultimate good of the country from the economic point of view. When the demand is so small there is no " large market " in the sense in which that phrase was used by the Fiscal Commission, nor is there the kind of market upon which the industry can be built up. As Mr. Reed himself has admitted, the economical production of locomotives requires that the unit of production must be about 200 locomotives per year. The output of Messrs. Kerr, Stuart and Company, the firm of which Mr. Reed is the Managing Director is of about this magnitude, and it does not rank as one of the largest or most important in the industry in Great Britain. Owing to the restriction of the Indian market, no economy in the cost of production, as the result of manufacture and repetition work on a large scale, will be possible. The overhead charges alone would so load the industry that the manufacture of locomotives could not be made a commercial proposition. On this account the cost to the country of any protective measures taken would be very heavy, and the results attained would not be commensurate. Before we ask the country to make the heavy sacrifice which is involved in the encouragement of the industry, we must be satisfied in our own minds that the sacrifice will be of a temporary nature and that in the end the country will thereby secure to itself a real advantage in the establishment within itself of an industry of immense national importance. We are not satisfied that this will be the case. The burden upon the community will be heavy and continue to be so indefinitely and until the domestic demand approximates to the output of the smallest unit which can be economically and efficiently operated.

Difficulty increased by variety of types.

17. There is another aspect of the case which cannot be ignored. Unless the requirements of the Indian Railways consist of not more than one or two types of locomotives, it is doubtful whether, even if the whole order were placed with the Peninsular Locomotive Company, it could be executed without excessive cost, for the larger the variety of the types, the greater is the cost of production. To expect the Railways to stereotype a particular design, merely in order to supply work to an indigenous enterprise, is to ask for an impossibility having regard to the varying circumstances of traffic in such a large system as that of India.

18. For the reasons which we have given we are unable to make any recommendations for the grant of protection to the locomotive building industry. We consider it desirable on national grounds that the industry should be established in India, and we believe that this could eventually be done, provided substantial assistance were given by Government in the earlier years. But the existence of a sufficient market for locomotives in India is an indispensable preliminary condition, and at present this condition is not satisfied. If protection were given now, the country would carry a heavy burden during the next five years, and at the end of that period the progress made would be insufficient to justify the sacrifice.

Reasons why no recommendation possible.

19. In the communiqué to which we have referred a definite statement was made that the Government of India were "in a position to give a general undertaking that tenders will be invited annually in India for all the Railway locomotives and locomotive boilers required by Government during the 12 years commencing with 1923." It was further stated that the requirements of Government alone would be 400 locomotives a year from 1925 onwards. A communiqué so generally worded could not but be construed as an invitation by the Government to commercial enterprise to come forward and establish the manufacture of locomotives in this country, and Mr. Reed, in giving evidence for the Peninsular Locomotive Company, stated that this communiqué was "the origin of the company." Our attention was, however, drawn by Mr. Hindley to passages in the records of the Railway Board which suggested that, even before the issue of the communiqué, the promoters of the Company were prepared to start the construction of locomotives in this country without claiming any special treatment or guarantee. That may very well be the case. But it does not follow that, if the communiqué had not been issued, they would have been able to raise the capital required, or that the Company would have been floated successfully. The important fact is that the Company was not registered until more than two months after the communiqué was published, and, in these circumstances, part at least of the share capital was probably subscribed in view of the statements it contained. The Peninsular Locomotive Company is now placed in the unfortunate position that the demand for its products, which it was led to believe was certain, has ceased to exist. We recognize that the need for economy in Railway administration is paramount, and that the Railway authorities cannot be expected to purchase locomotives which they do not need. But the complete falsification of the forecast made by the Railway authorities little more than two years ago cannot but affect adversely the prospect of raising capital for Railway industries in India, and the position in which the Peninsular Locomotive Company has been placed deserves, and will no doubt receive, the special consideration of the Government of India.

Effect of Government of India's communiqué.

CHAPTER III.

Steel Castings.

Firms engaged in the manufacture of steel castings.

20. The manufacture of steel castings is carried on in some of the Railway workshops in India and also by three private firms. The works of the Kirtyanand Iron and Steel Works, Limited, are situated in the coalfields about 1½ miles from Rupnarainpur on the East Indian Railway, and those of the Hukumchand Electric Steel Company at Ballygunge in Calcutta. Both these firms make castings for sale. The third firm Messrs. Fairbairn, Lawson, Combe and Barbour (India), Limited, is engaged in the manufacture of jute machinery, and has erected a plant at its works at Sarsatala, Jamgaon—near Asansol—primarily in order to make the castings required for such machinery, but also for sale. Applications for protection have been received from the first two firms but not from the third. The Kirtyanand Iron and Steel Works, Limited, commenced to manufacture in February 1922. At the end of that year the paid-up share capital was about Rs. 7½ lakhs, and debentures for Rs. 4 lakhs had also been issued. The total block account, less depreciation, was then a little over Rs. 10 lakhs. The Hukumchand Electric Steel Company began to manufacture in July 1922. No complete balance sheet had been prepared by this Company at the time their case was presented to us, but we were informed that the concern is privately owned by Sir Sarupchand Hukumchand and Company, and that the capital expenditure incurred on land, buildings, and machinery, etc., was about Rs. 10 lakhs.

Processes of manufacture.

21. Steel castings, like iron and brass castings, are made by pouring the molten metal into sand moulds which have been given the forms which it is desired the castings should take. There are several processes by which the molten steel can be prepared and the choice between them depends on the total output of the works, on the size and shape of the castings likely to constitute the bulk of the output, on the quality required and on the raw materials available. The Kirtyanand Iron and Steel Works, Limited, have adopted a " converter " process. Molten pig iron is first poured into a converter, and air under fairly high pressure is then blown on to its surface. The impurities present in the metal are thus removed. If the quality of the castings is to be satisfactory, the pig iron used for this process must contain very little phosphorus, and for this reason Indian pig iron is not suitable. Only imported pig iron is used by the Kirtyanand Iron and Steel Works, Limited. At the Hukumchand Electric Steel Works an electric process has been preferred. The raw material, light steel scrap,

is charged into a small furnace with a 'basic' lining. Large carbon electrodes pass down through the roof of the furnace, and by the passage of an electric current an arc is maintained inside the furnace. The heat of this arc melts the scrap, and when the molten metal has been suitably refined—chiefly by means of lime—it is transferred from the furnace to the sand moulds. After the castings made by either process have been taken from the sand moulds, they are cleaned and usually require annealing, *i.e.*, heating slowly in a special furnace to a dull red heat and then cooling slowly. Most castings also require a small amount of machining, for the accurate adjustment of one or more of the dimensions, before they pass into use.

Differences between the manufacture of rolled steel and of steel castings.

22. It is desirable that we should emphasise the fundamental differences between the manufacture in India of rolled steel and of steel castings. These differences exist in the nature of the raw materials employed, in the methods of manufacture, and in the purposes for which the finished products can be employed. Rolled steel is made at Jamshedpur entirely from Indian pig iron; steel castings are made either from imported pig iron or from steel scrap. In the manufacture of rolled steel the molten metal is poured into ingot moulds which are all of much the same form, and it is in the rolling mills that the steel is given the shape which renders it suitable for the work in which it is to be used. In the manufacture of steel castings, the molten metal is poured at once into sand moulds which have already been given the shape for which the casting is to be used. Rolled steel shapes such as beams, angles and plates can be adapted for many different uses by fabrication; the steel casting has from the first been given a special shape for a special purpose and can be used only for that purpose. This third difference is of great importance. The steel casting is always and essentially a part of something else. It may for example be a part of a Railway wagon or locomotive, or it may be a constituent part of a machine. The prospects of the industry, therefore, necessarily depend on the growth and development of other industries. Unless the manufacture of Railway wagons, and to a certain extent of machinery, is established in India, the manufacture of steel castings is not likely to succeed.

Claims put forward by the Companies.

23. In their original representation of 4th September 1923 the Kirtyanand Iron and Steel Works, Limited, asked that a duty of 33⅓ per cent. should be imposed on all steel castings imported from abroad, and apparently intended (though this was not explicitly stated) that the same rate of duty should be applied to steel castings coming in as spare parts of machinery or as railway material. As an alternative, the Company suggested the grant of a "suitable bounty." The request made on behalf of the Hukumchand Electric Steel Works was that their products should receive "exactly the same treatment in the matter of a protective tariff

as the Tata Company's." The oral examination of the witnesses made it clear that both firms were finding it difficult to sell their products in the face of competition from abroad, but that the amount of assistance they asked for had been determined by the claim made on behalf of the Tata Iron and Steel Company, and not by any exact calculation of costs and prices.

First condition laid down by the Fiscal Commission.

24. If Indian pig iron were well adapted for the manufacture of steel castings, the industry would start with a substantial natural advantage, because Indian pig iron is relatively cheap. As we have already explained, however, Indian pig iron contains too much phosphorus, and the castings made from it by the converter process are not satisfactory in quality. In so far as it is necessary to use imported pig iron for the manufacture of steel castings, we do not think it can be shown that India possesses any natural advantage, and it is doubtful whether the industry could ever hold its own without protection. The use of imported raw material also does much to invalidate the argument which might be founded on the importance of the industry from the point of view of national security. The weight of the pig iron used is nearly 50 per cent. greater than the weight of the steel castings produced, and in a national emergency, when sea communications were severely restricted, it would be easier to import the castings than the raw material. If, therefore, the claim to protection can be made good at all, it must be in favour of the alternative process which uses steel scrap as its raw material.

Sufficiency of the supplies of steel scrap.

25. The evidence we have taken makes it clear, we think, that in the Calcutta area steel scrap is likely to be available in sufficient quantities to supply the needs of the steel casting industry. The East Indian Railway Company informed us that the quantity of steel scrap likely to be available for disposal annually was from 3,000 to 5,000 tons, while the Bengal Nagpur Railway Company estimated that they would put on the market about 700 tons annually. Apart from the Railways, in a large industrial district such as Calcutta, a considerable amount of steel scrap is produced, and some of it is unusable at present except by the steel making process. Up till now the Hukumchand Electric Steel Company has been able to purchase the steel scrap it requires at an average price of Rs. 30 a ton, which is lower than the prices prevailing for similar material in other countries. Its output, however, has not exceeded 50 tons a month, whereas the eventual output may be five times as great. It is possible that, with an increasing demand for scrap, the prices might rise, but so far as can be judged at present, the industry does possess an advantage as regards raw materials.

Labour and Power.

26. In respect of labour the industry is at no special disadvantage. Iron castings have been made in India for a great many years, and it is not difficult, therefore, to obtain workmen who have already acquired a good deal of experience and can readily learn such special processes as are needed in steel casting. The cost of electric power is of

course an important factor in production costs, and although the rates at which power is supplied by the Calcutta Electric Supply Corporation at present are not as low as in specially favoured districts in other countries, the difference between the cost to the Indian producer and the corresponding cost to his competitors in other countries is not likely to be very great. On the whole, the prospects of the industry are not unfavourable, but there is one element of uncertainty, *viz.*:—the extent of the probable demand for steel castings.

The market for steel castings in India.

27. We have found it very difficult to estimate even approximately the probable annual demand for steel castings in India. The imports are not shown separately in the Trade Returns, and in the nature of the case it is hardly possible that they should be. As we have pointed out in paragraph 22, the steel casting is almost invariably a part of something else, and would be classified as a component part of a locomotive or a Railway wagon or as machinery. The figures supplied to us by the principal Company-worked Railways showed that in 1922-23 they imported nearly 600 tons of steel castings separately and about 3,000 tons as parts of rolling stock. There are great and unexplained differences between the figures given by the various Railway administrations, and we are doubtful whether the Railway demand can be accurately determined on this basis. The figures suggest, however, that apart from the steel castings produced in the workshops of the Bombay, Baroda and Central India Railway at Ajmere (800 tons), and in the East Indian Railway workshops at Jamalpur (200 tons) the annual consumption of steel castings by all the Railways in India (excluding those imported as parts of complete wagons and locomotives) is not less than 1,000 tons and may be more.

Steel axle-boxes for Railway wagons.

28. The Hukumchand Electric Steel Company suggested to us that the annual Railway demand for steel axle-boxes required for replacements would of itself more than suffice to keep their works fully employed. The figures supplied by the Railway Companies do not, however, support this theory. Much must depend, moreover, on the policy followed as regards the replacement of cast iron axle-boxes by steel axle-boxes. If the Railways generally were to make this change, there would probably be a very large demand for several years. But once the use of steel axle-boxes had become universal, it is not clear what the annual consumption would be. One of the advantages claimed for the steel axle-box is its greater durability, and the annual demand during the period of replacement is no index of the probable demand once the process of replacement is complete.

Demand for steel castings in connection with the manufacture of wagons in India.

29. The prospects of the steel casting industry must obviously be affected by the success attained in the manufacture of Railway wagons in India. If that manufacture were once firmly established, it would create a steady demand for steel

castings. But the quantity required is only 7 cwts. per wagon, in the case of the A-I covered broad-gauge wagon (the only type for which we have details), so that for every 1,000 such wagons, the total quantity of castings needed is only 350 tons. The full capacity of the Kirtyanand Iron and Steel Works is about 200 tons a month, and of the Hukumchand Electric Steel Company about 250 tons a month, and unless the output of the Indian wagon building firms expands much more rapidly than is expected, their requirements will not go far to keep the steel foundries occupied. The establishment of locomotive building in India would provide an important market for steel castings, but that industry is not likely to start without Government assistance at the outset, and for the reasons given in Chapter II we have been unable to recommend that it should be protected.

Other uses for steel castings.

30. Apart from those required for Railway rolling stock, the most important classes of steel castings which have been brought to our notice are colliery tub wheels, bridge bearings, and certain parts of machinery. We have no data from which we can estimate even approximately the probable demand for steel castings for these purposes, though probably the colliery tub wheels are the most important. So far as machinery is concerned, much must depend on the policy finally adopted by the Government of India as regards encouraging the manufacture of machinery in India. So long as the steel casting works are dependent on replacement orders for particular parts of machinery, their costs are bound to be high because it is only on repetition work that they can hope for cheap production.

Difficulty of formulating proposals for encouraging the manufacture of steel castings.

31. If it were established that the steel casting industry deserved support from Government, it would still be difficult to decide by what means protection should be given. The imposition of protective duties at once raises the problem whether a higher duty can be imposed on the component parts of rolling stock or machinery than on the complete wagon or machine, and, if so, whether this higher duty should be enforced only when the parts are imported separately. We have recommended in our Second Report that the manufacture of Railway wagons should be fostered by the grant of bounties. It may be that a similar method would be best in the case of those castings which are needed for wagons. As regards those castings which are component parts of machinery, it would hardly be possible for us to make recommendations at all, untilf we had reviewed all the questions connected with the manufacture of machinery in India. But before we can satisfy ourselves whether protection is necessary or what the amount should be, the extent of the probable demand for steel castings in India must clearly be determined.

No recommendations made at present.

32. So far as we have been able to ascertain the facts at present, it is not clear that the annual demand for steel castings in the area which can be commanded from Calcutta is sufficient to keep

even one of the steel foundries fully employed. The complete figures from the Railway administrations did not reach us until a late stage in our enquiry, and it was not until we reviewed all the evidence that we realised how important this factor was likely to prove. The output of steel castings must clearly be limited by the demand, and at the same time the cost of production is largely determined by the output. Unless some estimate can be formed of the probable output, it is hardly possible to determine the cost of production, or to assess the amount of protection needed. For this reason we are unable to make any general recommendations at present. One class of steel castings, however, will benefit from a proposal which we have made in our Second Report, for colliery tub wheels will become subject to the import duty of 25 per cent. which has been proposed for the tubs.

CHAPTER IV.

Enamelled Ware.

Imports and raw materials.

33. The manufacture of enamelled ware in India is of very recent growth. Up to 1914 the bulk of the imports were obtained from the Continent of Europe, but since the war supplies have been drawn chiefly from Japan. The import figures are—

	Value of all imports.	Value of imports into Calcutta.
	Rs. lakhs.	Rs. lakhs.
Average of the three years 1911-12 to 1913-14 .	27·2	6·7
1920-21	42·9	9·8
1921-22	20·1	6·6
1922-23	23·6	5·7
1923-24 (10 months' figures multiplied by 6/5) .	29·7	

The raw materials required by the industry are thin steel sheets with a smooth surface and the various substances used in preparing the enamel glaze. Steel sheets are already manufactured at Jamshedpur by the Tinplate Company, but not for sale, the whole output being converted into tinplate. The Tata Iron and Steel Company will commence the manufacture of black sheets in September 1924, and are under contract to supply sheets suitable for enamelling to a Company—Enamelled Ironware, Limited—which has been established at Jamshedpur. Most of the materials required for the glaze have to be imported. The process of manufacture is comparatively simple and does not require an expensive or elaborate equipment. The industry can, therefore, be carried on by firms with a low capitalisation, working on a limited scale.

Firms engaged in the production of enamelled ware.

34. We have received representations from four firms who are interested in the manufacture of enamelled ware. Three of them—the Bengal Enamel Works, Limited, the Bengal Enamel and Stamping Works, and the Pioneer Enamel Works, Limited—have established their works at or near Calcutta; the fourth—Enamelled Ironware, Limited—is located at Jamshedpur. This last Company was about to commence manufacture when we visited Jamshedpur in August 1923, but no information has since been received as to the progress made. When we took the evidence of the other three firms in September and October 1923, they were manufacturing on

a small scale only, and had not reached anything like full production. The capitalisation of the four Companies is as follows:—

	Rs. lakhs.	
Enamelled Ironware, Limited .	9	
Bengal Enamel Works, Limited	2	(Includes working capital.)
Bengal Enamel and Stamping Works.	3	(This amount has actually been spent on the equipment of the factory.)
Pioneer Enamel and Iron Works, Limited.	3	(Rs. 60,000 is the sum actually raised and spent.)

It will be seen that the capitalisation of the Jamshedpur Company exceeds that of the other three put together, but they have given no evidence as to their probable output. The other three firms have given the following estimates of their requirements of steel sheets:—

Bengal Enamel Works, Limited	500 tons in the near future and 1,000 tons eventually.
Bengal Enamel and Stamping Works.	About 240 tons.
Pioneer Enamel and Iron Works, Limited.	100 tons at present and 1,000 tons eventually.

Limited market for enamelled ware in India.

35. It would be a mistake to attach undue importance to the estimates which the firms have given of their probable output. They have not yet had sufficient experience to forecast accurately the amount of work they will be able to undertake, and their anticipations may be wide of the mark. In particular their output must necessarily be limited by the demand for enamelled ware in India. All the three Calcutta firms estimate that the cost of the steel sheets will be about a third of the cost of the finished goods, and the cost of sheets suitable for enamelling appears to be about Rs. 350 a ton. On that basis the consumption of 500 tons of steel sheets means an output the value of which will exceed Rs. 5 lakhs, or nearly equal to the total imports at Calcutta in 1922-23. Unless the demand increases substantially, it does not seem possible that all the firms can attain the output they hope for.

Claims made by Enamelling firms.

36. The Tata Iron and Steel Company has made a contract with Enamelled Ironware, Limited, by which for the first five years the price paid for steel sheets is the mean of the English and American prices for similar materials, *plus* ten shillings per ton. This Company will not be affected at the outset, therefore, by any additional duty which may be placed on raw steel. The other three Companies submitted representations urging that they would be seriously prejudiced if the import duty on steel sheets were raised

to 33⅓ per cent., as proposed by the Tata Iron and Steel Company. They contended that that Company would not be able for several years to produce steel sheets suitable for enamelling and asked that they might be allowed to import their sheets free of duty to enable them to overcome the difficulty of the first few years' working. The Bengal Enamel Works, Limited, specifically asked that they might be allowed also to import free of duty the chemicals required for the enamel glaze, and the other firms, in oral examination, concurred in this request. All three firms spoke of a heavy fall in the prices of enamelled ware and of keen competition both from Germany and from Japan, but all three were opposed to an increase in the present import duty of 15 per cent. *ad valorem*. They explained that in India enamelled ware was used for the same purposes for which vessels made of brass and aluminium were used, and they apprehended that, if the price were substantially increased, the demand for enamelled ware would at once decline.

The manufacture of enamelled ironware deserves encouragement.

37. The prospects of the enamelled ware industry are not, we think, unfavourable, if the initial difficulties are once overcome, and it is certainly desirable that the manufacture should be established in India. It affords an opening to the small capitalist and the technical processes are not of great difficulty, whereas most of the industries which use steel as their raw material involve the raising of a large amount of capital and the employment of highly trained experts. We think that some assistance from Government is necessary, but the precise measures to be taken require consideration.

Relief asked for by the industry.

38. It seems to be clear, for the reasons given by the firms themselves, that nothing would be gained by imposing a higher duty on imported enamelled ware. The market is not a large one, and, if it were further restricted, the prospects of the industry would be prejudiced and not improved. Nor are we able to support the proposal that the firms should be allowed to import the steel sheets they require free of duty. The practical difficulties would be great, for no means has been suggested by which the Customs officers could discriminate between the special qualities of sheet which are suitable for enamelling and other sheets. An alternative arrangement might be possible by which the firms would receive a rebate of Customs duties paid by them on imported sheets in proportion to their output of finished goods. It would, however, be wholly inconsistent with protection for the steel industry to exempt from duty sheets of the kind which is likely to be produced at Jamshedpur. The Tata Iron and Steel Company are under contract with Enamelled Ironware, Limited, to supply them with sheet suitable for enamelling, and the doubt that has been expressed as to their ability to do this is not, we think, well founded. The Tinplate Company are already manufacturing from steel made at Jamshedpur sheets of a similar quality to the kind required, and there is no reason why the Tata Iron and Steel Company should not be equally successful. If the

cost of the steel sheet is one-third of the value of the finished goods, the present ten per cent. duty is approximately 3 per cent. of the same value. The increase of the duty to 15 per cent. (as we have proposed in our First Report) would then mean an increase in the cost of production of 1½ per cent. It is quite possible, however, that the Tata Iron and Steel Company may be able to supply the Calcutta firms with the sheets they require at a price not higher than they are paying at present. It has been suggested that they should give them the same terms which they have already granted to Enamelled Ironware, Limited, and the Tata Iron and Steel Company have promised to consider the matter. But apart altogether from a special arrangement of that kind, it is in the interests of the steel industry that the manufacture of enamelled ware in India should continue, and if an increase in the price were likely to endanger its existence, the steel manufacturer would no doubt take that fact into account.

Import duty on enamelling materials.

39. The Bengal Enamel Works, Limited, has supplied us with a list of the raw materials required for the manufacture of enamel glaze, and an estimate of the quantity required on the basis of an annual consumption of 450 tons of sheet. The most important items in point of value are:—

	Cost including import duty.
	Rs.
Borax and boracic acid . . .	59,500
Cryolite	31,500
Cobalt Oxide	31,175
Antimony	12,100
Felspar, ground	11,200
Total	1,45,475
Other materials	29,625
GRAND TOTAL .	1,75,100

The first five items are at present subject to an import duty of 15 per cent. If it were possible to admit these materials free of duty, the consequent reduction in the cost of production of enamelled ware would much more than counterbalance the increase in the duty on black sheets. It is on these lines, we consider, that assistance can best be given to the industry, and the removal of the duty on raw materials which are not produced in the country is in all respects consonant with a fiscal system which aims at the encouragement of industry by discriminating protection. We understand that several applications have already reached the Government of India from other industries in which proposals either for the removal of the duties on imported raw materials, or

for exemption from such duties, have been made. It seems to us desirable that, as far as possible, these proposals should be considered simultaneously. The general principles which should regulate the grant of concessions require careful examination, and since a sacrifice of revenue may be involved, the relative urgency of the various claims may have to be settled. For this reason we have deferred making definite recommendations in favour of the enamelled ware industry, though we think that its claims to assistance of this kind are strong.

CHAPTER V.

Conclusion.

Board's proceedings.

40. We desire to record our indebtedness to those commercial bodies and firms, and also to those private persons who submitted written statements to the Board or gave oral evidence, to the Provincial Governments who supplied us with much useful information, and to the principal Railway Companies and Port Trusts who sent detailed replies to our questionnaries. In many cases witnesses were asked to supplement the information originally given by further statements, and our requests were invariably and most courteously complied with. As was natural, our demands fell heaviest on the claimants for protection, and particularly on the Tata Iron and Steel Company, but we should also acknowledge specially the assistance given by the Indian Engineering Association and some of the engineering firms, and by the Railway Companies. The compilation of the figures which we asked for involved the expenditure of much time and labour, and but for the assistance we received, we should have found it impossible to carry through our investigations. We are particularly indebted to those firms (see Statement VI, Annexure A) who permitted us to visit their works, and to the gentlemen who took us round on the occasion of these visits and explained the processes of manufacture. These visits formed a most valuable part of our enquiry and enabled us to appreciate much more clearly the written and oral evidence with which we had to deal.

Publicity.

41. There is one aspect of our proceedings to which we draw special attention. In paragraph 303 of their Report, the Fiscal Commission laid stress on the importance of publicity to inspire confidence and remove the possibility of suspicion that recommendations are based on anything but the public interest. It is on this principle that we have acted throughout. The Tata Iron and Steel Company were unwilling at the outset to make public their pig iron costs, because the information disclosed might conceivably be of use to their competitors in India. Eventually, however, they informed us that the whole of the evidence they had given might be published. In the case of other firms also we were able to overcome the apprehensions which they originally felt, and secured their consent to the publication of the greater part, if not the whole, of the evidence which at first had been given confidentially. We have lost no opportunity of emphasising the value of publicity, and it is our firm conviction that, as far as possible, evidence should be taken publicly. At the same time, however, there are occasions when

the choice lies between receiving evidence confidentially and not obtaining it at all, and in such cases our practice has been to take evidence *in camera* and then to secure the consent of the witness to the publication of as much of it as possible. It is the publication of details of the cost of production which most commonly gives rise to difficulties. The Tata Iron and Steel Company was eventually able to agree to the publication of all the evidence tendered on its behalf, because it has no competitors in India; but this is an exceptional case, and, to take one example, some of the engineering firms were naturally unwilling at a time of intense competition to place at the disposal of rival firms the details of their manufacturing costs. This difficulty is bound to recur during the course of our enquiries and cannot be ignored. Where protection is claimed on behalf of an industry in which several firms are engaged, we do not think it will be possible to take the whole of the evidence in public, for in that case indispensable information would not be obtained at all. The Fiscal Commission itself recognized that the whole investigation might not be conducted in public. Each case must, we consider, be dealt with on its merits, but our aim would invariably be to secure publicity wherever possible.

The Board's Technical Adviser.

42. To assist us in our enquiry into the steel industry, Mr. R. Mather, the Government Metallurgical Inspector at Jamshedpur, was appointed as our technical adviser, and joined us at Jamshedpur on his return from leave on August 20th 1923. We desire to record our deep appreciation of the very valuable services which Mr. Mather has rendered. The difficulties of a very arduous and complicated enquiry would have been doubled, had we not been able to rely in all technical matters on his accurate knowledge, clear judgment and indefatigable energy. At all stages of our work, whether in the examination of witnesses, the sifting of the evidence recorded, the formulation of proposals or the detailed working out of the general principles we had accepted, Mr. Mather was ready to help us not only with advice and criticism, but also with the closest and most cordial co-operation. For the recommendations made and the opinions expressed in our Reports we are, of course, solely responsible, but in so far as we have succeeded in presenting our conclusions regarding the technical aspects of the steel industry in a clear and coherent form for the consideration of the Government of India and the Legislature, it is to our adviser that in large measure the credit is due.

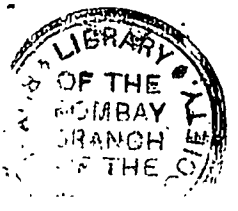
The Board's Secretariat and clerical establishment.

43. The post of Secretary to the Board was at first filled by Rai Bahadur Surendra Nath Banerji, Assistant Secretary to the Government of India in the Commerce Department. In November he was compelled by illness to vacate the appointment and his place was then taken by Mr. G. C. F. Ramsden, I.C.S., of the Central Provinces Commission. We are indebted to both officers for the careful and efficient manner in which the Board's work has been carried on. Our enquiries involved a heavy strain

on the clerical and reporting staff of the Board, who had frequently to work for very long hours in order to keep abreast of the evidence. We desire to acknowledge the cheerful and willing spirit in which they met the demands made upon them and the good work done by them.

G. RAINY—*President.*
V. G. KALE.
P. P. GINWALA.

G. C. F. RAMSDEN—*Secretary.*
March 15th, 1924.



ANNEXURE A.

Account of the Board's Proceedings.

The Resolution of the Government of India appointing the Tariff Board was published on the 10th July 1923 and the members took charge of their duties on the following dates:—

(1) The President . . . 5th July 1923.
(2) Mr. P. P. Ginwala . . 5th July 1923.
(3) Professor V. G. Kale . . 14th July 1923.

2. On the 17th July the following communiqué was issued by the Board inviting expressions of opinion on the proposal to grant protection to the Steel industry.

"The Tariff Board have been appointed to advise the Government of India as to the means by which effect should be given to the policy accepted by the Government of India and approved by the Legislative Assembly of adjusting the fiscal system of the country so as to foster the development of industries. In the Resolution of the Government of India in the Department of Commerce, No. 3748, dated 10th July 1923, the Board were directed to examine first the question of extending protection to the manufacture of steel in India. In order that the Board may proceed with their investigations without undue delay it is important that they should receive as soon as possible from firms or persons interested in the steel industry or the industries dependent on the use of steel full statements of their views.

"2. The primary question to be examined is whether the circumstances of the steel industry are such as to justify protection being extended to it and, if so, what should be the nature and extent of the protection given. But the Board have also to take into account the effect which any measures they recommend may have on industries dependent on the use of steel, and in particular the industries which manufacture wagons, locomotives and other Railway requisites. It will be necessary for the Board to keep this aspect of the case constantly in mind throughout their enquiries, and it will greatly facilitate their work if those interested in the industries referred to will submit statements of their views as soon as possible, and state at the same time whether they desire that a witness or witnesses, should be examined orally in support thereof.

"3. The Board's office will close in Simla on the 8th August and the Board will then proceed to Jamshedpur where the evidence adduced on behalf of the Tata Iron and Steel Company will be taken. On the completion of their work at Jamshedpur the Board will continue their enquiries at Calcutta on a date to be announced subsequently."

3. The evidence of the Tata Iron and Steel Company was taken at Jamshedpur between the 17th and the 27th of August and the

14th and the 21st of December. During both visits the Members of the Board had the advantage of visiting the Company's Works and also those of other firms at Jamshedpur. The rest of the evidence was taken at Calcutta between the 10th September and the 9th November and between the 5th and 10th December 1923; at Bombay between the 16th and the 29th November; and at Delhi between the 22nd and the 28th January 1924. Two short visits were also paid to Asansol, at the beginning of September and the end of October, for the purpose of visiting engineering and other works in the coal fields.

4. A list of the firms who submitted representations asking for the grant of protection to various steel products is given in Statement I (annexed), and also the dates on which they addressed the Board and on which their representatives were examined orally. In practically every case the Board found it necessary to ask for additional information and this was always readily supplied in supplementary written statements.

5. The views of the engineering industry on the question of protection for steel were stated in a written representation from the Indian Engineering Association of which most of the engineering firms are members. Rolled steel being the most important raw material of the engineering industry, the Association was naturally opposed to the imposition of protective duties which would raise its price, and considered that such assistance as might be required should preferably be given in the form of bounties. If, however, protective duties were imposed on rolled steel, then the Association recommended that duties at the same rate should also be imposed on fabricated steel. The views put forward by the Association were in substance (but with variations in detail) the views expressed by the engineering firms who addressed the Board. In order to ascertain as far as possible how the engineering industry was likely to be affected by protection for steel, a questionnaire was drawn up and addressed to a large number of engineering firms and detailed replies were received from several of them. Three firms interested in the manufacture of iron or steel also tendered evidence at the request of the Board. A list of these engineering and other firms is given in Statement II (annexed) together with the dates of the representations, and the dates on which the representatives of some of them were examined orally.

6. In order to ascertain the probable effect of protection for steel on Railway costs, the Board drew up three questionnaires relating to—

(*a*) Rolled steel and fabricated steel,

(*b*) Steel castings,

(*c*) Railway wagons.

These were issued to the principal Railway Companies in India from all of whom replies were received. The Board also received, through the Government of India, a letter addressed by the Indian Railway Companies to the Secretary of State. The Port Trusts

of the principal Indian ports were also addressed by the Board and gave expression to their views in written communications. Mr. Hindley, the Chief Commissioner of Railways, and representatives of four Railway Companies and of the Calcutta Port Commissioners were examined orally (see Statement III).

7. The Board received a number of other representations from commercial bodies, from firms and from private individuals. A list of those which were put forward on behalf of particular industries has been given in Statement IV, and of those which considered the question of protection for steel more generally in Statement V.

8. Two questionnaires were drawn up and addressed to the Provincial Governments. The first of these was directed to ascertaining the probable annual consumption of steel by Provincial Governments, and consequently the additional burden which protection for steel might entail on Provincial finances. The second was concerned with the probable effect of protection for steel on the cultivating classes and the minor industries and handicrafts whose representatives were not likely to approach the Board direct. The Board are greatly indebted to Provincial Governments for the information supplied.

9. In order that they might be better able to appreciate the evidence placed before them, the Board visited a number of Engineering and other works. A list of these is given in Statement VI.

10. In all the Board received 103 written statements from Provincial Governments, Railway Companies and Port Trusts, Chambers of Commerce and other commercial and industrial bodies, commercial and industrial firms, Government officers and private persons. Oral evidence was taken on 55 days during which 41 witnesses, or groups of witnesses, were examined.

STATEMENT I.

List of firms who submitted representations to the Tariff Board asking for protection, in one form or other, for steel products

No.	Product proposed to be protected.	Names of firms applying for protection.	Dates of written representation.	Dates of oral examination.
1	Rolled Steel . .	The Tata Iron and Steel Company, Limited	27-28th July 1923 . . .	17th, 18th, 20th, 23rd, 24th, 25th, 27th August and 14th, 15th, 17th 19th, 20th, 21st December 1923.
2	Steel castings . .	The Kirtyanand Iron & Steel Works, Ltd.	4th September 1923 . .	19th September 1923.
		The Hukumchand Electric Steel Works .	28th August 1923 . . .	17th September 1923.
3	Tinplate	The Tinplate Company of India, Ltd. .	14th August 1923 . . .	28th August and 10th September 1923
4	Railway wagons . .	The Indian Standard Wagon Company, Ltd.	21st August 1923 . . .	14th and 15th September and 2nd October 1923.
		Burn & Company, Ltd.	11th September 1923 . .	21st September and 2nd October 1923.
		Jessop and Company, Ltd. . . .	14th September 1923 . .	26th September and 5th October 1923.
5	Railway Locomotives .	The Peninsular Locomotive Company, Ltd.	3rd October 1923 . . .	20th December 1923.
6	Wire and Wire Nails .	The Indian Steel Wire Products, Ltd. .	30th August 1923 . . .	27th September 1923.
7	Agricultural Implements .	The Agricultural Implements Company, Ltd.	27th September 1923 . .	23rd November 1923.
		Kirloskar Brothers, Ltd	16th November 1923 . .	26th November 1923.
8	Enamelled Ware . .	The Bengal Enamel Works, Ltd. . .	21st September 1923 . .	4th October 1923.
		The Bengal Enamel and Stamping Works.	12th October 1923 . . .	29th October 1923.
		The Pioneer Enamel and Iron Works, Ltd.	15th October 1923 . . .	29th October 1923.
		Enamelled Ironware, Ltd. . . .	28th August 1923 . . .	

STATEMENT II.

List of Engineering Associations and firms and of firms interested in the manufacture of iron and steel who submitted representations to the Tariff Board or replies to the Board's questionnaire.

No.	Name of Association or firm.	Date of representation.	Date on which representative was examined orally.
1	Indian Engineering Association .	13th September 1923	24th September 1923.
2	Bombay Engineering Employers' Federation.	17th September 1923.	.....
3	Burn and Company, Limited .	11th September 1923	21st September and 2nd October 1923.
4	Jessop and Company, Limited .	14th September 1923	26th September and 5th October 1923.
5	The Vulcan Iron Works, Limited	15th September 1923	28th September 1923.
6	The Indian Iron and Steel Company, Limited.	4th October 1923	30th October 1923.
7	The United Steel Corporation of Asia, Limited.	3rd November 1923	5th November 1923.
8	The Bengal Iron Company, Limited.	3rd October 1923	8th November 1923
9	Richardson and Cruddas . .	9th August 1923 .	21st November 1923.
10	The Kumardhubi Engineering Works, Limited.	2nd November 1923.	5th December 1923.
11	Fairbairn, Lawson, Combe and Barbour (India), Limited.	10th November 1923	5th December 1923.
12	Parry's Engineering Limited .	14th August 1923	.....
13	The Angus Company, Limited	4th September 1923	.....
14	The Shalimar Works, Limited	11th September 1923	.....
15	Mackintosh Burn, Limited .	12th September 1923	.....
16	Heatly and Gresham, Limited .	24th September 1923	.....
17	Jas. Alexander and Company, Limited.	9th October 1923	.....
18	J. C. Gammon (Bombay), Limited	29th November 1923	.....

STATEMENT III.

List of Railway Companies and Port Trusts who sent replies to the questionnaires issued by the Board.

No.	Name of Railway Company or Port Trust.	Date or dates of replies.	Date on which a representative was examined orally.
1	Bengal Nagpur Railway Company	15th November and 11th and 22nd December 1923.	7th November 1923.
2	Great Indian Peninsula Railway Company.	2nd November, 15th and 22nd December 1923.	28th November 1923.
3	Bombay, Baroda and Central India Railway Company.	13th and 28th November 1923.	29th November 1923.
4	East Indian Railway Company .	2nd January 1924	7th December 1923.
5	Madras & Southern Mahratta Railway Company.	29th and 30th October and 2nd November 1923.	..
6	South Indian Railway Company .	16th, 20th and 23rd November 1923.	..
7	Burma Railway Company . .	23rd November 1923	..
8	Bengal and North Western Railway Company.	16th and 27th October and 15th November 1923.	..
9	Assam Bengal Railway Company	2nd and 5th November 1923.	..
10	Port Commissioners of Calcutta .	13th November 1923	6th December 1923.
11	Port Commissioners of Rangoon .	19th October 1923 .	..
12	Madras Port Trust . . .	30th October 1923 .	..
13	Karachi Port Trust . . .	16th November 1923	..
14	Bombay Port Trust . . .	20th November 1923	..
15	The Railway Board	..	26th and 28th January 1924.

STATEMENT IV.

List of Associations and firms representing industries likely to be affected by protection for steel who submitted representations to the Tariff Board.

No.	Name of Association or firm.	Date of representation.	Date on which a representative was examined orally.
1	Indian Mining Federation . .	28th September 1923.	
2	Indian Jute Mills Association .	1st December 1923.	
3	Indian Mining Association . .	11th January 1924.	
4	Turner, Morrison and Company, Limited.	30th October 1923 .	3rd November 1923.
5	Standard Oil Company of New York.	29th October 1923	3rd November 1923
6	Burma Electric Tramways and Lighting Company, Limited.	26th November 1923	
7	Madras Electric Tramways (1904) Limited.	27th November 1923	
8	Calcutta Tramways Company, Limited.	12th December 1923.	
9	East Bengal River Steam Service Limited.	6th October 1923.	
10	The British Burma Petroleum Company, Limited.	24th October 1923.	
11	Messrs. John Taylor & Sons' Committee.	25th October 1923.	
12	British Indian Electric Committee, London.	29th November 1923.	
13	The Indian Galvanising Company Limited.	28th January 1924.	

STATEMENT V.

List of Chambers of Commerce and other Commercial bodies, importing firms and private individuals from whom representations were received on the general question of protection for steel.

No.	Name of Chamber or Association.	Date of representation.	Date on which representative was examined orally.
1	Bombay Chamber of Commerce .	30th October 1923 .	26th November 1923.
2	Bengal Chamber of Commerce .	24th November 1923	10th December 1923.
3	Burma Chamber of Commerce .	1st September 1923.	
4	Madras Chamber of Commerce .	8th September 1923.	
5	Karachi Chamber of Commerce .	22nd November 1923.	
6	Upper India Chamber of Commerce.	25th January 1924.	
7	Indian Merchants' Chamber .	11th August 1923 .	27th November 1923.
8	The Punjab Trades Association .	27th July 1923.	
9	Marwari Association, Calcutta .	20th November 1923.	
10	The Native Share and Stock Brokers' Association, Bombay.	29th November 1923.	
11	Calcutta Trades Association .	28th December 1923.	
12	Calcutta Import Trade Association.	11th September 1923	1st October 1923.
13	Anandji Haridas and Company .	6th October 1923 .	8th October 1923.
14	Bombay Iron Merchants Association.	30th July 1923 .	19th November 1923.
15	Some Iron Merchants of Calcutta.	2nd October 1923 .	
16	George Service and Company .	20th November 1923	22nd November 1923.
17	Mr. George Pilcher, Calcutta .	2nd November 1923	9th November 1923.
18	Mr. M. Homi, Bombay . .	15th October 1923 .	16th, 17th, 19th and 20th November 1923.
19	Mr. A. Ramaiya, Madura . .	8th October 1923.	
20	Mr. M. S. M. Sharma, Bombay .	23rd November 1923.	
21	The Fiscal Reform League, India	15th January 1924.	
22	National Federation of Iron and Steel Manufacturers of Great Britain.	26th October 1923.	
23	Sheffield Chamber of Commerce .	1st October 1923.	
24	London Chamber of Commerce .	6th December 1923.	

STATEMENT VI.

List of the engineering and other firms whose works were visited by the Board.

No.	Name of firm.	Works visited.	Date of visit.
1	The Tata Iron and Steel Company	Works at Jamshedpur.	On several dates in August and December 1923.
2	Ditto . . .	Garumahisani Iron ore mine.	30th August 1923.
3	Indian Steel Wire Products Limited.	Works at Jamshedpur.	August 1923.
4	Indian Agricultural Implements, Limited.	Ditto .	Ditto.
5	The Tinplate Company of India (Limited).	Ditto .	Ditto.
6	Calmoni Engineering Works, Limited.	Ditto .	Ditto.
7	Peninsular Locomotive Company, Limited.	Ditto .	18th December 1923.
8	Indian Iron and Steel Company, Limited.	Works at Burnpur, near Asansol.	4th September 1923.
9	Indian Standard Wagon Company, Limited.	Ditto .	4th September 1923.
10	Bengal Coal Company . .	Coal Mine at Sodepore.	5th September 1923.
11	Kirtyanand Iron and Steel Works, Limited.	Works at Alladih near Rupnarainpur.	Ditto.
12	Bengal Iron Company . .	Works at Kulti .	6th September 1923.
13	Eastern Light Castings, Limited .	Ditto .	Ditto.
14	Angus Company, Limited . .	Works at Bhadreshwar.	8th September 1923.
15	Burn and Company, Limited .	Engineering Works at Howrah.	13th September 1923.
16	Jessop and Company, Limited .	Engineering Works at Howrah.	29th September 1923.
17	Ditto .	Wagon Building Works at Garden Reach, Calcutta.	Ditto.
18	Marshall Sons and Company (India), Limited.	Works at Agarpara near Calcutta.	September 1923.
19	Hukumchand Electric Steel Works	Works at Ballygunge.	Ditto.
20	Kumardhubi Engineering Works, Limited.	Works at Kumardhubi.	27th October 1923.
21	Kumardhubi Fire Clay and Silica Works, Limited.	Ditto .	Ditto.
22	Fairbairn, Lawson, Combe and Barbour (India) Limited.	Works at Sarsatala near Jamgaon.	28th October 1923.

ANNEXURE B.

Memorandum on the manufacture of Wire and Wire Nails.

Extent of the Industry.

1. In response to the Board's invitation calling upon all industries interested in, or likely to be affected by, the protection of rolled steel, the Indian Steel Wire Products, Limited, was the only Company which applied for the protection of the manufacture of wire and nails. It also gave oral evidence through one of its Directors, Mr. Walchand Hirachand. It has since come to the notice of the Board that there is another Company, called the Pioneer Nail Company of Calcutta, which manufactures wire nails. As it has not appeared before the Board, and as the Board have at their disposal no means of ascertaining its financial position or its manufacturing activities, the Board must proceed all along on the assumption that, at present, the only Company which is seriously interested in the manufacture of wire and its products is the Indian Steel Wire Products, Limited.

The Company has its works at Jamshedpur in fair proximity to the Tata Iron and Steel Company's Works. It has an authorised capital of Rs. 50 lakhs, of which about half has been issued and called up, though the amount actually paid up on the issue is about Rs. 21·6 lakhs. It has entered into various contracts with the Tata Iron and Steel Company for the supply of wire rods which is the principal raw material for its manufactures, as also for the supply of water and electricity at rates which appear to be fair and reasonable and not above the rates at which both can be had in other industrial parts of India. It has got a plant which the Board inspected at work which is said to have a capacity of manufacturing about 12,000 tons of all kinds of wire products when it is fully in operation. Though this is said to be the full capacity of the plant, in the course of the Board's investigation the Company has not presented them an estimate which fully covers that amount. The highest estimate placed before them is for a total output of 9,000 tons a year, working three shifts a day. In any event, whether the full capacity is assumed to be the one or the other, it is capable, as will be presently pointed out, of producing wire and wire products in quantities which will be equivalent to a substantial and the bigger portion of the demand of the country, as far as it can be ascertained. Though the Company was registered as far back as 1919, it did not commence operation until the beginning of 1923. It only reached the production of 120 tons in August 1923 and the manufacture was confined to the drawing of wire and the making of wire nails. The Company is equipped for the manufacture of galvanised wire but has not yet installed any machinery for the production of barbed and stranded wire. Under these circumstances, this enquiry must necessarily be confined to the conditions under which wire, plain or galvanised, and wire nails are manufactured.

Import of wire and wire nails.

2. The following figures are extracted from an advance copy of the Annual Statement of the Seaborne Trade of British India with the British Empire and foreign countries for the year ending 31st March 1923:—

Summary for 1922-23.

	Tons.	Tons.
Fencing Wire—		
United Kingdom	561	
Total British Empire		565
Germany	622	
Belgium	338	
U. S. A.	340	
Foreign total		1,330
TOTAL		1,895
Wire, other than fencing wire—		
United Kingdom	1,135	
Total British Empire		1,177
Germany	1,447	
Belgium	659	
U. S. A.	257	
Total foreign		2,616
TOTAL		3,793
Wire Nails—		
United Kingdom	629	
Total British Empire		664
Germany	6,650	
Belgium	3,912	
U. S. A.	1,378	
Total foreign		12,146
TOTAL		12,810

Government Imports.

Wire—		
United Kingdom		731
Germany	360	
Belgium	25	385
TOTAL		1,116

Total: All kinds: Wire and Wire Nails.

	British Empire. Tons.	Foreign. Tons.
Fencing wire	565	1,330
Other wire	1,177	2,616
Government wire . . .	731	385
Wire nails	664	12,146
TOTAL .	3,137	16,477
GRAND TOTAL .		20,614

Continental competition.

3. From the above figures it is clear that in the two kinds of manufacture in which the Company is at present engaged, the competition is mainly from Germany and Belgium and that the imports from the United Kingdom are relatively small, and judging by the average prices, they appear to be catering for the finer classes of wire and wire products which are not being manufactured in India. When in a later paragraph the prices of the British article are compared with those of the Continental and the Indian articles, this position will appear in a clearer light. On these figures and on Mr. Walchand's direct statement, the Indian manufacturer is at present not interested in the kind of articles which are imported from Great Britain, but it is clear that even eliminating this the Indian manufacturer has still left him a market of fairly big dimensions which he can capture. This market may at present be described as being in the neighbourhood of 16,000 tons per year on the figures of 1922-23.

The Company's plant which the Board inspected in August is equipped on a scale reasonably calculated to produce wire and wire products economically and on a commercial basis. The machinery is up-to-date and can be manipulated without much difficulty by the kind of intelligent Indian labour which is normally available in the country, under proper expert supervision during the initial stages. The quality of the wire produced appeared to bear a favourable comparison with the imported wire. In the matter of nails, however, there was room for more attention and care in the manipulation of the machinery which, though simple, requires careful adjustment in order to ensure the evenness of quality. In order to show how favourably this particular industry is situated with reference to Indian conditions, perhaps a short description of the process of manufacture and of the raw materials used may not be out of place.

Connection of wire drawing with the steel industry.

4. Where the industry has been established on an organised and extensive scale, it happens, not infrequently, that the manufacture of wire is carried on in conjunction with the rolling of wire rods which, in their turn, are rolled from

billets as part of the process of manufacturing steel. In this sense, wire drawing may be described as a continuation of the processes relating to the manufacture of the cruder forms of steel. In many industrial organisations, however, the processes have, as in the case of the Indian Steel Wire Products, Limited, been separated, that is to say, ready-made wire rod of suitable size is purchased and subjected to further processes for the purpose of drawing it into wire and manufacturing from it other products. Wire so drawn may be used plain, or coated with zinc or other metal. Plain or galvanised wire, again, may be converted into ropes, barbed wire, woven wire-fencing, nails and various kinds of products.

Raw material and process.

5. Wire rods are the principal raw materials of these manufactures. As indicated elsewhere they are at present imported. Their manufacture forms part of the programme of the Greater Extensions of the Tata Iron and Steel Company. Though open hearth basic steel is not suitable for the manufacture of the finer and more expensive varieties of wire and wire products, it is quite suitable for the manufacture of all kinds of ordinary wire and wire products which represent the bulk of the Indian demand.

Wire rods come to the wire mill usually in coils. Their diameter varies, but ordinarily it is less than a quarter of an inch. Previous to the drawing process they have to be cleaned, usually by immersion in a hot solution of sulphuric acid—a process which adds considerably to the cost of production—in order to remove the scale left on them by the rolling process. They are then washed and put into a lime bath. This removes the last traces of the sulphuric acid, and helps the lubrication they have to receive subsequently in the drawing process. They are next heated in a baking oven to ensure the complete removal of the bad effects of the sulphuric acid. They are thereafter drawn through a succession of hard steel dies in which are holes. By passing through holes which are successively smaller and smaller the wire attains the requisite diameter. In order to prevent the wire from becoming too hard it may be necessary to heat it in an annealing furnace and to subject it more or less to the same cleaning processes as the wire rods before it is ready for use.

When the wire has reached this condition, if it is to be used for making wire nails, it is taken to the nail machine. It is an automatic machine which performs all the processes in rapid succession which are necessary to the production of the finished nail. As the wire is fed into the machine it is " seized by gripping dies, and the head formed on the end by the blow of a heading tool. As the header withdraws, the wire is pushed forward the length of the nail, and the cutting dies advance from the sides and clip off the nail, forming its point. The ejector disposes of this nail just as the wire behind is advanced to be headed. The nails are cleaned of the lubricant and oil of the drawing process and of the ' whiskers ' which may be left at the point of the nail by the pointing machine

by being shaken up with saw dust in tumbling barrels. Special finishes may be given to nails to meet special needs."

A simple industry.

6. There are two principal objects in view in describing these processes in somewhat greater detail than was necessary on their own merits. First of all, to make it clear that the mechanical equipment of the industry is, if moderately expensive, mainly automatic in operation, mastery over which can fairly easily and without unduly prolonged training be acquired by intelligent Indian labour. Though the wisdom of the course adopted by the Indian Steel Wire Products, Limited, so early in their career of reducing their expert European supervision to a single foreman is not clear, it is some proof of the statement that the industry is one in which the problem of training Indian labour enters less largely than in most other industries which have come under the Board's review. Its principal raw material, moreover, is, or will be very soon, on the spot. The power required by it is relatively small, and is obtained cheaply and in sufficient quantity. As has been already stated, its home market is considerable and within its reach. Under these circumstances, this industry is suited to the industrial conditions of India, and the chances of its success are considerable.

Secondly, to emphasize the fact that the manufacture of nails is separated from that of drawing wire by the intervention mainly of automatic machines, several of which can be looked after by a single workman properly trained for the purpose. The Indian Steel Wire Products Company employ at present one attendant per one machine and a foreman to about every dozen men. Owing to the simplicity of the machinery, the expenditure of direct labour on the production of nails is likely to be so small that it is unnecessary to examine the cost of their production separately from that of the manufacture of wire. Even if it were necessary, it is not possible to do so because the Company themselves do not maintain their costs separately and therefore there are no materials before us on which they can be investigated. Mr. Walchand, one of the Directors of the Company, who gave evidence, complained that the German manufacturer sold his nails cheaper than his wire, because what he spent on the slight labour and overhead on machinery, he more than recovered by using up the short lengths and 'waster' coils of wire in making the nails. The principle can be applied to Indian conditions only with a good deal of caution and not a little modification, but it may be taken as an indication of the low cost of the nail making operation and as a sufficient additional reason for not separately examining the costs of production of the two articles. The cost of production of one ton of finished plain wire may now be discussed.

Cost of production.

7. This expression has several different meanings, and it may perhaps be as well to indicate in what sense it is used throughout this memorandum. It includes (*a*) all costs incurred by the manufacturer at the works and

briefly called the works costs and (*b*) all overhead charges, which must be added to (*a*), to arrive at a figure at which he can sell the article without any profit or any loss.

(*a*) The works costs may be sub-divided as follows:—

(1) Metal cost.

(2) Cost above metal, including—

(*i*) consumable stores, *e.g.*, sulphuric acid, lubricants, etc.;

(*ii*) coal and coke;

(*iii*) water and electricity;

(*iv*) wages of labour and supervision.

(*b*) The overhead charges may be sub-divided as follows:—

(*i*) Depreciation.

(*ii*) Interest on working capital.

(*iii*) Head office charges.

(*iv*) Miscellaneous direct and indirect charges.

Difficulties of the question.

8. In dealing with either aspect of the cost of production, there are several difficulties which, it must now be obvious, are not peculiar to this industry only. Firstly, the industry is represented, so far as there is any evidence, by one manufacturer, the Indian Steel Wire Products, Limited. The result is that the Board are not in a position to compare their cost with that of any other competing manufacturer in this country; nor are they in a position to make a comparison with recent foreign costs. Secondly, at the time the Board examined the representative of the Company (27th of September 1923) the Company could place before them only four months' experience of manufacture, and the works costs available are therefore limited to that short period. Thirdly, for the same reason, the industry has not reached that stage of productivity which contributes to a reasonable reduction of the works cost, or of the overhead charges per ton of production. Working three shifts a day, the plant is capable of producing 750 tons per month or about 9,000 tons per annum of finished wire. With one shift per day fully employed it is thus possible for it to produce 250 tons per month or 3,000 tons per annum. Even this has not been achieved, for the production did not exceed 87 tons in May, 84 tons in June, 111 tons in July, and 120 tons in August 1923. The consequences of such a state of affairs are not difficult to understand. As will be presently shown even by the moderate increase in production from 87 tons in May to 120 tons in August, the works cost above nett metal dropped from about Rs. 82-13-0 to Rs. 76-4-0 per ton, a difference of Rs. 6-9-0 per ton. According to the figures supplied by the Company the works costs, when the production rises to 750 tons per month, are expected to drop to about Rs. 65-8-0, a further difference of Rs. 10-12-0 per ton, or a difference of Rs. 17-3-0, equivalent to about 20 per cent. compared with the

works costs in May 1923. According to the revised figures arrived at in paragraph 11, a still further drop of Rs. 7-2-0 per ton may be expected, thus raising the total difference since May 1923 to Rs. 24·5 per ton, equivalent to about 30 per cent. The difference between the overhead charges spread over 87 tons and 750 tons per month will appear enormous.

Necessity of increased output.

9. In the light of the above facts, any enquiry into the cost of production will be fruitless unless it is conducted with reference to an actual or assumed production which represents a reasonable quantity per annum. The actual or the assumed quantity must be large enough to produce at least a minimum quantity of economic results. In the case of this industry the actual production is too small, and any results based upon it must be forthwith dismissed as extravagant for the reasons already given. The only alternative is to assume a quantity of annual production which, in all the circumstances of the case, appears on the whole to be reasonable. The full output of 750 tons a month cannot be worked up to within at least 3 or 4 years. It will, therefore, be out of the question to work out the cost of production on that output at the present moment. Nor, on the other hand, can the output of 120 tons per month which was attained in August 1923, be accepted as reasonable in the case of an industry seeking national assistance. There is no reason why, since that date, and if the proposals here put forward are given effect to, the production should not reach the full output at least of a single shift, that is to say, 250 tons a month or 3,000 tons a year. The wire industry is, in all countries where it has been successful, one of large plants and therefore of large production. The plant itself is large enough, and it can, and ought to, produce at least a third of its possible output at the end of its first year of working, and within three or four years attain to its fullest output. The Board must, therefore, conduct their enquiries into the cost of production and make their recommendations on the basis that the annual production is at least 3,000 tons.

(*a*) Works cost. (1) Metal cost.

10. The first item in the works cost is the nett metal cost. At present the wire rods which form the principal raw material are imported. They are of continental origin, and cost, landed at the works, Rs. 8-8-0 per cwt. or Rs. 170 per ton. For the reasons given in paragraph 25 in dealing with the question of compensatory protection, it may be assumed that, even when the Company have to buy locally manufactured wire rods, their cost per ton will remain, unless there is some further drop in British and American prices, in the neighbourhood of this figure. One ton of finished wire, however, requires, owing to wastage in the process of manufacture, an additional quantity which will fairly be represented by an extra 10 per cent. Taking the price of wire rod at Rs. 170 per ton, the nett metal cost with the additional 10 per cent. amounts to Rs. 187 per ton of finished wire.

11. *Cost above metal.*—The following figures were, under this heading, given by the Company for the four months from May to August 1923, and on the assumption that the full output of 750 tons per month was attained (*vide* Appendix E and Appendix G to Statement III):—

(2) Cost above metal.

	May.	June.	July.	August.	Full output.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
1. Stores, etc.	42 8 0	45 8 0	33 9 6	35 0 0	38 8 0
2. Coal and coke	5 0 0	5 0 0	5 13 0	4 8 0	5 10 0
3. Electric and water supply.	9 0 0	8 0 0	13 5 0	12 12 0	6 12 0
4. Wages	27 5 0	24 13 6	29 0 0	24 0 0	14 10 0
TOTAL	83 13 0	83 5 6	81 11 6	76 4 0	65 8 0
Production	87 tons.	84 tons.	111 tons.	120 tons.	750 tons.

It will be seen that of the four months, the figures for August are the lowest in each item except that the charge for electric and water supply has risen from Rs. 9-0-0 in May to Rs. 12-12-0 in August, though the production in the latter month was higher than in the former. Mr. Walchand explains this difference by stating that the price they pay to the Tata Iron and Steel Company is regulated by the price of coal and that there has been a rise in its price. He also thinks that the figures cannot be taken as absolutely correct, as the system of keeping the costing account had not been worked long enough. When the output increases there should naturally be a reduction in this charge, and it would not be unfair if, at any rate, this item was reduced from Rs. 12-12-0 to Rs. 9-0-0, the figure for May and June. This reduces the total for August from Rs. 76-4-0 to Rs. 72-8-0.

The biggest item in the cost above metal is the one for stores, etc. A detailed list of charges under this head is given in Appendix K to Statment III, dated the 18th October 1923. The amount is reduced from Rs. 42-8-0 in May to Rs. 35-0-0 in August. Sulphuric acid accounts for more than Rs. 14 in the list. If the output increases from 120 tons in August to the assumed output of 250 tons per month, there is room for further reduction, and if the proposals which are under consideration for the removal of the duty on sulphur are accepted, there is a certainty of reduction in the cost of sulphuric acid. There are, therefore, reasonable grounds for the reduction of this item from Rs. 35 to Rs. 32-8-0. For the same reasons the figure of Rs. 38-8-0 should be reduced when the

full output is attained, to Rs. 32-8-0. The reason why this figure, when the output is much higher than in August, should be higher than that for August is not apparent.

The next big item is under labour. This has been reduced from Rs. 27-5-0 in May to Rs. 24-0-0 in August. When the output as compared with August is more than doubled, the charge under this head must go down. A reduction therefore of 25 per cent. under that head does not appear to be unreasonable, and accordingly, it may be reduced to Rs. 18 from Rs. 24. In the absence of any definite evidence to the contrary, the Company's figure of Rs. 14-10-0 for the final future output under this heading may be accepted.

There is a slight increase under the head coal and coke in the future figures, as compared with August, which has not been explained, and for which there is no justification on the evidence.

The revised figures, therefore, are as follows:—

——	Output 250 tons per month.			Output 750 tons per month.		
	Rs.	A.	P.	Rs.	A.	P.
1. Stores, etc.	32	8	0	32	8	0
2. Coke and coal	5	8	0	4	8	0
3. Electric and water supply	9	0	0	6	12	0
4. Wages	18	0	0	14	10	0
TOTAL .	65	0	0	58	6	0

The figure of Rs. 65 bears, on the smaller output, a fair comparison with Rs. 58-6-0 on the bigger output, and it may accordingly be allowed as being reasonable under all the circumstances taken together.

12. The total works costs are per ton:—

Total works costs.

	Rs.
Nett metal	187
Above metal . . .	65
TOTAL .	252

13. Overhead charges on one ton of wire:—

(b) OVERHEAD CHARGES.

(i) Depreciation.

(i) *Depreciation.*—The Company was asked to work out the total depreciation on plant and machinery and on build-

ings. Depreciation on plant and machinery at 7½ per cent. and on buildings at 2½ per cent. is reasonable. The Company gave the following figure for depreciation per month (*vide* Appendix F to Statement III, dated 18th October 1923):—

	Rs.
Depreciation on plant and machinery at 10 per cent.	4,820
On Buildings at 2½ per cent.	809
TOTAL	5,629

If the depreciation on machinery is reduced from 10 to 7½ per cent., the figures for the two are per month:—

	Rs.
Plant and Machinery	3,615
Buildings	809
TOTAL	4,424

14. The Company claim interest at 9 per cent. on a working capital of Rs. 4 lakhs. The amount of capital may be accepted as reasonable. But the claim for interest should be reduced from 9 to 7½ per cent., which is reasonable. On this basis, the interest on working capital per month is Rs. 2,500.

(*ii*) Interest on working capital.

15. The Company claim under this head Rs. 3,000 per month. It is not proved that the maintenance of such a costly head office in Bombay, and so far from the works, is conducive either to efficiency or economy. The industrial conditions of the country, however, are such that most industries are managed on behalf of companies by Managing Agents whose headquarters are, ordinarily, at one or other of the bigger commercial centres. The principal reason assigned for this is that the finances of almost every industrial company are dependent largely upon the credit, influence and business reputation of the Managing Agents. So long as these industrial conditions remain the same, this system has to be tolerated as a necessary evil, and on that ground mainly it is not easy to propose any other course than the acceptance of the figure claimed.

(*iii*) Head office expenses.

16. These are intended to cover insurance, postage, labour, welfare and other charges. On the average of four months from May to August, a sum of Rs. 1,000 per month is adequate.

(*iv*) Miscellaneous charges.

The figures for overhead charges per month may now be summarised as follows:—

	Rs.
(*i*) Depreciation	4,424
(*ii*) Interest on working capital	2,500
(*iii*) Head Office	3,000
(*iv*) Miscellaneous	1,000
TOTAL	10,924

On the assumed production of 250 tons per month the overhead charges per ton come to about Rs. 44.

17. The total cost of production per ton thus comes to—

Total cost of production.

	Rs.
Total works costs (*vide* paragraph 12)	252
Overhead charges	44
TOTAL	296

18. It must now be determined how much per ton should be added to the figure of Rs. 296, to enable the industry to earn a reasonable profit on its investment. In the case of the smaller industries, of which the wire industry may be regarded as one, a return of 10 per cent. is reasonable, and any figure below that will fail to attract Indian capital.

Profit on investment.

The total called up capital of the Company is just under 25 lakhs. The paid up amount, however, is about 21·6 lakhs, according to their last balance sheet. The capital, therefore, which is entitled at present to earn may be taken as 21·6 lakhs. Excluding the value of stores this amount approximately represents the total block value of the Company's property according to the last balance sheet. A return of 10 per cent. on this amount means 2·16 lakhs per annum.

The question that now arises is: over what production is this amount to be spread? If it is to be earned on a production of 3,000 tons per annum or 250 tons per month, it works out at Rs. 72 per ton. This would involve too heavy a burden upon the country, and it would be regarded as commercially unsound to load a quarter or a third of the possible production with the whole of the profits of such possible production. No industry can, within such a short period of production as one year after the commencement of business, expect a return on the whole of its invested capital. The case against such a claim by an industry

asking for national assistance is even stronger. They should therefore be allowed on each ton of actual production a profit per ton calculated on the full capacity of the plant. The capacity of the plant has been assumed to be 9,000 tons per annum. The total profit on that output is 2·16 lakhs or Rs. 24 per ton. This rate of profit on 3,000 tons per annum produces a total of Rs. 72,000 per annum.

The price at which wire can be sold at a profit.

19. The price that the industry ought to get per ton is therefore Rs. 320 per ton as under:—

	Rs.
Total cost of production	296
Profit . "	24
TOTAL .	320

C i.f. landed price of foreign wire.

20. The price at which imported wire enters and is sold in India should next be determined. According to Mr. Walchand, common wire which comes chiefly from the Continent is sold in India, after having paid duty at 10 per cent. *ad valorem*, at Rs. 15 per cwt. —or Rs. 300 per ton. The tariff valuation of one ton of wire nails, which for practical purposes may be assumed to be the valuation for wire, is Rs. 280. Deducting from Rs. 300 the duty of Rs. 28 per ton but not the trade charges, commission, etc., the nett price is Rs. 272 per ton. A further deduction on account of these charges, say at the rate of 5 per cent., gives the c.i.f. landed price of approximately Rs. 260 per ton.

The question now is: can this safely be taken as the price at which, without duty, imported wire enters this country? The figure given by Mr. Walchand, though low, is borne out by the quotations in the Calcutta Prices Current, a weekly publication issued by the Bengal Chamber of Commerce. The Tariff Valuation of Rs. 280 per ton is in substantial agreement with Mr. Walchand's figure after deduction of duty.

According to figures received from the Chief Controller, Indian Stores Department, the f.o.b. prices of wire nails imported from the United Kingdom were as follows:—

Date.		Rs.	A.
30th November 1923	2" . . .	15	15
16th November 1923	2½" . . .	14	7
30th November 1923	3" . . .	14	4

These f.o.b. prices work out on an average at Rs. 15 per cwt. or Rs. 300 per ton.

Another Rs. 25 added will give the approximate c.i.f. landed price of Rs. 325 per ton. These prices are higher than Continental

prices. No one need be surprised at the difference, for it has been found in connection with the kind of Continental rolled steel which competes against Indian rolled steel, in bars, for instance, that there is a difference of about £2 per ton between Continental and British prices in favour of the former.

Amount of protection.

21. Upon the figures obtained in paragraphs 19 and 20, the protection which the industry ought to receive, and which ought to be recommended, is Rs. 60 per ton. This is the difference between the price at which wire can be manufactured and sold at a reasonable price in India, and the price at which the foreign wire can be sold, if no duty had to be paid upon it. The recommendation should apply equally to wire specified in paragraph 22 and all wire nails.

Uniform specific duty on all wires.

22. In connection with the duty on wire it is important to decide the form which the duty should take and the classes of wire to which it should apply. At present the duty is on a uniform basis of 10 per cent. *ad valorem* on all kinds of wire. But the Company is not equipped to make barbed wire or stranded fencing wire, and nothing should be added to the burden on these. They are not specially expensive forms of wire, and since a specific duty of Rs. 60 per ton would be equivalent to much more than the present duty, barbed wire and stranded fencing wire should continue to pay 10 per cent. *ad valorem*. The remaining kinds of wire which are imported fall into two main groups—(*a*) single strand plain or galvanised wire made of ordinary soft steel for telegraphs, baling, light fences and a large number of miscellaneous purposes; and (*b*) special wire either made of soft steel drawn to extremely fine wire or made of harder steels and hardened and tempered or " patented " for springs, umbrella fittings and purposes where special strength or properties are required. The Company are equipped to make the kinds of wire falling into group (*a*), and it is to these that protection should be given by the application of a specific duty of Rs. 60 per ton. The Company are not in a position to make the wires in group (*b*) and have stated that they do not wish protective duties to be applied to them. These wires have a much higher value per ton than the others. The values vary considerably, but much the greater proportion of these wires coming into India would fall within the limits of Rs. 500 to Rs. 800 per ton c.i.f. If these were subject to duty on a different basis from the common wires, the Customs authorities would be involved in many difficulties in satisfactorily identifying them for appraisal. These wires, therefore, also should bear a specific duty of Rs. 60 per ton. This would be equivalent to an *ad valorem* duty varying between about 12 and 7 per cent. It is not very likely that this would add appreciably to the burden of any user, and the probable slight fall in revenue on account of these kinds of wire would be more than offset by the increased simplicity of administration by the Customs, and would be trifling in comparison with the extra revenue produced by the

duties on the common wires, which preponderate enormously in weight.

If at any time circumstances should necessitate the imposition of an offsetting duty on common wire, the inclusion of these other wires in the same item in the Tariff Schedule might have to be reconsidered.

Effect of our recommendations.

23. If the proposals above made are accepted, the burden upon the consumer will rise from about Rs. 28 to Rs. 60 per ton or from 10 to 22 per cent. *ad valorem*. According to the figures given in an earlier paragraph, the total imports of all kinds of wire and wire nails per year amount to about 20,000 tons; therefore, even if all kinds of wire were affected by these proposals, the total additional burden at Rs. 32 per ton would not exceed Rs. 6·4 lakhs. This does not, however, represent the extra revenue which the Government may expect to get. If the estimate of 3,000 tons per annum is realised, the nett increase cannot exceed about Rs. 5 lakhs, and as the domestic output increases this amount must in proportion diminish.

The total burden will not be excessive. The incidence of the increased burden will be diffused, perhaps, over a larger number of consumers than most other steel products. Moreover, the actual protection that the industry gets is not so high as the figures suggest. Out of the duty of Rs. 60 per ton, at least Rs. 20 may be regarded as compensatory protection even on the present rate of duty on steel, for which the tariff, and not the industry, can be held accountable. The cost of metal has been taken as Rs. 187 per ton. This includes a duty on wire rod at 10 per cent. *ad valorem*, or a duty of about Rs. 17 per ton. In addition, the consumable stores, the value of which has been taken as Rs. 32-8-0 per ton, take away in duty about another Rs. 3 per ton. India cannot have it both ways. She cannot expect to have her manufactured products cheaply as well as derive a revenue from the taxation of their principal raw materials, whether for revenue or protective purposes, or partly for one and partly for the other, as, indeed, is the case in this particular instance. In this respect, so far as competition from the free trading United Kingdom is concerned, India must accept the position of remaining at a disadvantage in common with other protectionist countries, whilst Indian consumers may derive some little consolation from the fact that part of their sacrifice reverts in the end to the State in the shape of additional Customs revenues.

The remaining Rs. 40 per ton, which represents protection in itself to the industry, needs some explanation. The figures given in paragraph 20 suggest a difference between the British and Continental prices of about £4 per ton in this class of manufacture. The Customs figures also tend to prove that the imports from the United Kingdom as compared with those from the Continent are relatively small. One of the legitimate inferences that can be drawn from these facts is that in the inferior forms, at any

rate, of this class of manufacture the Continental countries are able even to undersell the United Kingdom in India. Such being the relative position of the United Kingdom, it would be strange if better results were possible in India, especially during the initial stages of any industry.

The necessity for recommending as high a protection as Rs. 40 per ton arises mainly from the circumstance that the actual production is so small compared to the possible output. In proportion as the production increases, the works cost and, to a far greater extent, the overhead charges will steadily come down, and when the full output is reached, there will be little or no need for protection, unless in the meanwhile conditions which cannot at present be foreseen arise. In order to make the meaning clearer, reference may be made to the figures in paragraphs 11 and 17, where, on a production of 3,000 tons per annum, the cost above metal has been taken as Rs. 65 per ton, and the overhead charges at Rs. 44 per ton, respectively. The figure for the former, when the output reaches 750 tons per month or 9,000 tons per year, is Rs. 58-6, a difference of Rs. 6-10 per ton. If the overhead charges are likewise spread over this amount, they will come down, in proportion, from Rs. 44 to about Rs. 15 per ton, a difference of about Rs. 29 per ton. When the full output is reached, the protective duty of Rs. 40 per ton can be reduced by the total of these figures, that is to say, by Rs. 35-10. The industry may thus be expected to stand on its own legs, apart from compensatory protection.

Adequacy of recommendation.

24. The Company in its final proposals (*vide* Appendix F to Statement III, dated the 18th October 1923) suggested a duty of Rs. 5 per cwt. in addition to the present *ad valorem* duty of 10 per cent., or, in other words, a duty amounting to Rs. 128 per ton as against the present duty of Rs. 28 per ton. No case has been made out for the acceptance of a proposal so extravagant. There were no figures available on which it could be substantiated. It may be admitted that the figures arrived at above are approximate and therefore imperfect; but, on the whole, they should be far nearer the mark than the figures the Board were asked to accept. It is true that they have been only allowed a proportionate profit on the production. Any industry which is able to make any profit at all during the first two or three years of its existence should consider itself fortunate. In any case, if it is a hardship, it must be accepted as one inseparable from the lot of an infant industry. By improved expert supervision the Company can easily increase its output and so increase its profit. Every additional ton produced means a reduction in the cost above metal and, as has been indicated in paragraph 23, a substantial reduction in the overhead charges. If to this is added the possibility, by paying greater attention to the quality of the nails manufactured, of commanding an easier market than at present, the Company may do even still better than would appear at first sight.

Increased cost of wire rod : compensatory protection.

25. As has been stated before, wire rod is the principal raw material of the industry. Under the Board's proposals for the protection of bars and rods by a duty of Rs. 40 per ton, the wire rods would have cost this industry Rs. 195 per ton, whereas at present they are able to import continental wire rod at Rs. 170 per ton. An additional compensatory protection of Rs. 25 per ton would, under ordinary circumstances, have been necessary. No proposals on these lines, however, are necessary, for the reason that by an agreement entered into between the Tata Iron and Steel Company and the Indian Steel Wire Products Limited for a period of 5 years, the former have bound themselves to supply to the latter 4,000 tons of wire rod at a price which is to be the mean of British and American f. o. b. prices *plus* ten shillings per ton. These prices happen to be in the neighbourhood of about £11 per ton, and therefore the price payable in future will be approximately equal to the price at which the Company is importing at the present moment. It is possible, however, that, as Mr. Walchand hopes, the price to the Company may go down when the Tata Iron and Steel Company commence their deliveries. In that case, the industry may, by that fact, get more profit than has been taken into account. On the other hand, it is equally possible that British and American prices which, in this particular class of manufacture, have a normal tendency to be higher than the Continental prices, may further develop in that same direction. In this event the profit may turn out to be smaller than it otherwise would be. It must be assumed, however, that the Company entered into this contract after fully weighing the fact that their cheapest market for purchasing wire rods was, at the time, the Continent, and that if, in the event, the contract turned out to be unfavourable, they would cheerfully accept that position as arising from a reasonable risk which they had undertaken with their eyes open in the ordinary course of business. It is perhaps of some interest to note that, if the British and American prices do not rise above their present level, the Tata Iron and Steel Company are giving to the wire industry compensatory protection at the rate of about Rs. 25 per ton which should otherwise have had to be given by the country.

Offsetting duty.

26. If circumstances make it necessary, an offsetting duty in accordance with our proposals in Chapter III of the First Report should be levied.

Proposals.

27. The proposals may now be summarised as follows:—

(1) That a specific duty of Rs. 60 per ton be levied on wire nails and on all wire, plain or galvanised, other than barbed or fencing wire. These two kinds should remain subject to the present *ad valorem* duty of 10 per cent.

(2) That if and when necessary, an offsetting duty be levied on nails or any plain wire.

ANNEXURE C.

Note on the increased cost of wagon building in India due to the higher duties proposed on rolled steel.

Broad Gauge Wagons.

The only list of quantities for broad gauge wagons which is sufficiently detailed for purposes of calculation was supplied by Messrs. Burn and Company for the 750-type wagon for which they tendered in 1913 (see printed statements of Indian Standard Wagon Company, pages 21 and 22). The total weight of the materials of which details are given is 132½ cwts. The summarised statement on page 22 shows the weight (without wheels and axles) of the 750-type wagon to be 131 cwts. and of the A-1 type to be 153 cwts. Both types are 4 wheeler covered goods wagons, and the Board were informed that the designs were generally similar.

2. The items are shown in Statement I (annexed). On items totalling over 99 cwts. the additional duty will be about Rs. 88. On items totalling 30 cwts. there will be no additional duty. The items forming the remaining 3 cwts. (screw-couplings etc.), are not definitely classified, but the extra duty (if any) on all of them will not exceed Rs. 5. The extra duty on the materials for the 750-type wagon would thus be about Rs. 93. The A-1 type wagon is about 17 per cent. heavier, and if it is assumed that the material is divided in much the same way as in the 750-type, the additional cost of the materials, due to the higher duties, would be about Rs. 110.

3. It was not made clear in the evidence whether the weights shown in the statement were the weights of the materials actually in the finished wagon or of the materials consumed. The latter would be between 5 and 10 per cent. higher than the former. If it be assumed that they are the weights as in the finished wagon, and that 10 per cent. more material has to be consumed, a further sum of Rs. 11 should be added. A total of Rs. 121 thus appears to be the maximum amount for the extra duties on the materials required for an A-1 type wagon.

Metre Gauge Wagons.

4. The most detailed list of quantities for metre gauge wagons was supplied to us by the Bombay, Baroda and Central India Railway with their letter No. T.-219, of January 5th, 1924. The wagon dealt with is the M. A.-2 type, 4 wheeler covered goods. The weight of the finished wagon (without wheels and axles) is 90 cwts. The materials of which we have been given particulars total 98 cwts. in weight. The quantities thus appear to be those

of the materials consumed in the manufacture of the wagon. They can be classified as follows:—

Material.	Quantity.	Present duty: 1924 Valuations.	Proposed Duty.	Increase.
	Cwts.	Rs.	Rs.	Rs.
Channels	9	7·6	13·5	5·9
Angles	16·6	12·4	24·9	12·5
Plates	40·5	30·4	60·8	30·4
Bars	7·4	5·0	14·8	9·8
Bars for rivets and bolts .	3·5	2·4	7·0	4·6
TOTAL MATERIAL SUBJECT TO EXTRA DUTY.	77·0	57·8	121·0	63·2

Not subject to extra duty.

Spring steel . . . . . }
Springs . . . . . } Total weight, 21·0 cwts.
Iron stampings (assumed to be grade A) . . }
Castings of brass, steel and iron . . . }

Materials not classified.

Door controllers.
Miscellaneous stores.

It will be seen that material forming 80 per cent. of the weight is subject to extra-duties totalling Rs. 63·2. If the door controllers and certain parts of the miscellaneous stores are made of materials subject to extra duties, the total additional duties on the materials for the M. A.-2 type wagon would be about Rs. 70.

ANNEXURE C.

STATEMENT I.

Broad Gauge Wagon.

(4 wheeler covered goods.)

Table of duties.

Material.	Quantity.	Present duty : 1924 Valuations.	Proposed Duty.	Increase.
	Cwts. qrs. lbs.	Rs.	Rs.	Rs.
Angles	16 2 16	12·4	24·8	12·4
Channel.	19 0 26	16·3	28·8	12·5
Plates (⅛" or over) . . .	23 1 19	17·5	35·1	17·6
Flats, rounds, etc.	6 1 8	4·2	12·6	8·4
Sheet or Plate (under ⅛"). . .	6 0 7	5·3	9·1	3·8
Roof sheets	5 2 20	8·5	12·8	4·3
Bars for Buffers, Rivets, Bolts, Axle-guards, Wearing strips, Door details and Shoe brackets . . .	22 0 1	14·8	44·0	29·2
Total classified .	99 1 13	79·0	167·2	88·2

Items unclassified.

Draw bar cradle	Total weight 3 0 8
Screw couplings	
Split pins	

Items on which there will be no change.

Axle boxes, Spring shoes, Face plates, Hanger brackets, Cast Iron, Wrought Iron (Presumed Grade A), Yorkshire Iron, Spring steel, Galvanised rivets, Galvanised washers, Wearing blocks Vacuum brake and Springs.	Total weight 30-0-4

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